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OIL & GAS DEVELOPMENTS IN PENNSYLVANIA IN 1958

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DEPARTMENT of INTERNAL AFFAIRS

Genevieve Blatt, Secretary

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Carlyle Gray, State Geologist

1959

This Report is

Dedicated to the Memory of

Colonel Edwin L. Drake

whose oil well triggered the petroleum industry

and

John F. Carll

pioneer petroleum geologist and engineer whose geological techniques and theories aided greatly in establishing the role of the geologist in petroleum exploration.

Colonel Edwin L. Drake

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by

William S. Lytle, John M. Bergsten,
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ABSTRACT

Pennsylvania had an outstanding year in deep (Middle Devonian or older) exploration for oil and gas. A wildcat in Summerhill Township, Crawford County, the Joe Kardosh No. 1, became Pennsylvania's first basement test. This well is reported to have been completed as a dry hole in Pre Cambrian granite wash at a total depth of 8030 ft. A second wildcat became Pennsylvania's first deep commercial oil producer. This well, Lewis Forro, Jr. No. 1, was drilled in Beaver Township, Crawford County and was completed as the discovery well in the Forro pool. The initial production amounted to 27 bbls. of oil per day and 300 MCF of gas from the Medina section (Lower Silurian). A third wildcat became the State's deepest producer of gas. This is the Royal Rhodes No. 1 well in Jenner Township, Somerset County, which discovered Oriskany sandstone (Lower Devonian) gas at 8420 ft. Production amounted to 3100 MCF of gas after fracturing at a rock pressure of 3602 p.s.i. in 116 hrs. discovering the Boswell field on the Boswell dome. A fourth wildcat, James S. Blair No. 1, in Donegal Township, Westmoreland County, discovered the Seven Springs field on the Seven Springs Anticline. The well produced 3663 MCF of gas natural from the Onondaga chert (Middle Devonian), at a rock pressure of 3250 p.s.i. in 10 days. During the year there were two successful new field wildcats completed, eight successful new pool wildcats, including one found by drilling deeper an old well, and five successful outpost wells. Of the unsuccessful wildcats nine were new field wildcats and eight were new pool wildcats. Four outposts were unsuccessful. The Rockton field in Clearfield County had 32 development gas wells drilled in it during the year, while the Nolo field in Indiana County was second with 12 development gas wells. At the end of the year the developed area of the Rockton field was about 11,000 acres. One hundred nineteen deep wells were completed in Pennsylvania in 1958, with a total footage of 827,443 ft. Six reactivated wells drilled 330 ft. Of the 119 wells, 75 were gas wells, 2 were oil wells and 42 were dry holes.

The shallow-sand (Upper Devonian or younger) territory of western Pennsylvania had two new pool discoveries. One well discovered the Farran pool in the New Alexander field in Derry Township, Westmoreland County. Production was from the Balltown sand amounting to 3170 MCF of gas per day after fracturing, with a rock pressure of 1370 p.s.i. in 24 hrs. The Filander pool in the Webster field of Westmoreland County was the second new pool. The gas was discovered in the Big Injun with an open-flow at 3397 MCF per day natural at a rock pressure of 400 p.s.i. in one hour. One outpost well in the Boone Mountain field extended the shallow sand gas field while a second outpost in this field was unsuccessful.

John F. Carll

Shallow-sand drilling activity decreased in 1958 over that of 1957. In all, 668 shallow-sand wells were completed. Of these, 258 were gas wells, 24 were oil wells, 46 were dry holes, and five were drilled for underground gas storage. Three hundred and thirty-five were drilled in connection with secondary-recovery oil operations. In addition to the 668 new wells, 21 wells were deepened aside from the secondary-recovery oil operations, and 17 wells were deepened in connection with secondary-recovery oil operations. The total footage for the new and deepened wells was 1,511,911 feet. As in 1957 the secondary-recovery projects in the Bradford field and development drilling in the gas fields dominated the shallow-sand drilling activity during 1958.

Oil production decreased from 8,210,000 bbls. in 1957 to 6,471,680 bbls. in 1958. Pennsylvania's proven oil reserves were estimated at 120,018,000 bbls. as of December 31, 1958. Gas production increased from 107,004,000 MCF in 1957 to an estimated 115,000,000 MCF in 1958. The total footage drilled, both shallow and deep, was 2,339,684 feet.

INTRODUCTION

This publication summarizes the oil and gas developments in Pennsylvania for 1958. Assembled in Table 1 are the summarized records of the deep wells (Middle Devonian or older) drilled during 1958. These records are supplementary to those in Tables 1, Bulletins M31 and M39, Progress Reports 150, 151, and 154, Fourth Series of the Pennsylvania Topographic and Geologic Survey. Bulletin M31 includes those deep wells completed prior to 1950; Bulletin M39, those drilled between 1950 and 1955; Progress Report 150, those drilled during 1955; Progress Report 151, those drilled during 1956; and Progress Report 154, those drilled during 1957. Activities in the shallow sands (Upper Devonian or younger) since 1950, are described in Progress Reports 135, 139, 143, 144, 147, 150, 151, and 154 of the Pennsylvania Topographic and Geologic Survey. A classification of both the deep and shallow wells, exclusive of those drilled for gas storage and secondary-recovery purposes, is given in table 2.

Table 2, Deep and shallow well completion summary, Pennsylvania, 1958

	Oil	Gas	Dry	Total	Percent Successful
Exploratory tests	1	17	22	40	45
Development wells *	25	317	66	408	84
Total	26	334	88	448	80

*Does not include wells drilled in connection with underground gas storage or secondary-recovery oil operations.

ACKNOWLEDGEMENTS

In connection with the preparation of this review, the writers acknowledge the cooperation of Paul W. Garrett, Jr., the Bradford District Producers Association, and the Northeastern Gas and Oil Scouts. Virginia Fairall of the Pennsylvania Bureau of Topographic and Geologic Survey staff did the drafting and assisted with the compiling of the data.

DEEP-SAND DEVELOPMENTS

The oil and gas operators in Pennsylvania, by the years end, had discovered two new gas fields, seven new gas pools, one new oil and gas pool, and extended several gas producing areas. The producing-depth record for Pennsylvania was shattered in 1958 with the completion of a well in Somerset County which found gas production at a depth of 8420 ft. in the Oriskany Sandstone. Pennsylvania's first offshore well, located in Lake Erie, was completed as a gasser in the Medina section Silurian age. The first basement test in Pennsylvania was completed during the fall of 1958 with the plugging of a well in Crawford County which found granite wash at a total depth of 8030 ft.

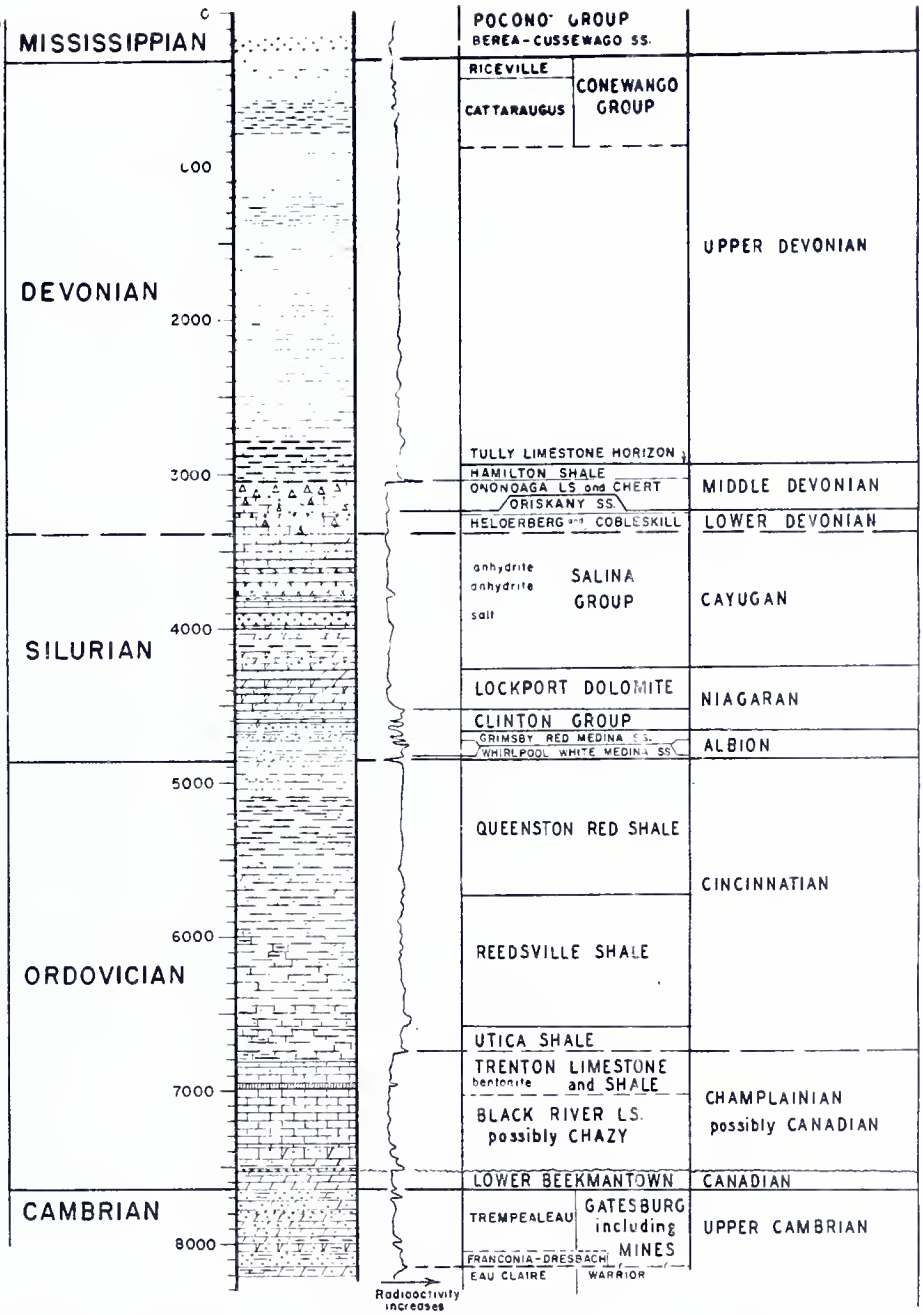
Summarized records of the deep wells completed in Pennsylvania during 1958 are assembled in table 1. On the map (plate 1) are shown the location of the wells. The stratigraphic positions of the formations tested are shown on plate 2. By the end of 1958, a total of 1860 deep wells had been drilled in Pennsylvania. Most of this drilling has taken place since 1930 when only 36 deep wells had been drilled. Of the 1860 deep wells drilled to date, 1044 were gas wells, two were oil and gas wells, 744 were dry holes, and 70 were drilled for gas storage.

Of the 103 wells drilled during 1958 to the Oriskany Sandstone, or deeper, 67 were gas wells, two were oil and gas wells, and 34 were dry holes. Another 9 were completed as producers in the Onondaga chert and 6 were abandoned before reaching the Oriskany after drilling below the Tully Limestone (top of Middle Devonian). Pa. Tract 75 No. 1 well was completed at a total depth of 7936 ft. It is questionable as to whether this well penetrated the Tully. Out of the 119 deep gas wells completed in 1958, eighty-two wells were fractured, of which 71 were successful. The total open-flow capacities before fracturing was 41,662 MCF of gas daily compared to 274,940 MCF of gas per day after fracturing. Ninety-six of the deep wells completed during the year were drilled with rotary tools, most of these with air rotary, and 23 with cable tools.

Almost all deep wells drilled in Pennsylvania are fractured before completion. The Onondaga chert (Middle Devonian) fractures readily and gas production from this formation is increased greatly due to fracturing.

One hundred nineteen deep wells were completed in 1958 as compared with 173 in 1957, a decrease of 31 percent. The greatest number of completions occurred in the Rockton field in Clearfield County where 32 gas producers and 11 dry holes were drilled. The Nolo field in Indiana County was second with 14 completions, 12 of which produced gas.

Table 3 summarizes the deep well completions in Pennsylvania in 1958. Included in this table is the Blass well of Erie County which was a re-activated well discovering a new pool after drilling 200 ft. A columnar section and gamma ray log of a deep well in western Pennsylvania on plate 2 shows the stratigraphic positions of the formations penetrated. Figure 1 shows the annual rate of deep-sand exploration and development since the discovery of the Tioga field in 1930, the first deep-sand field to be opened in Pennsylvania.



COLUMNAR SECTION AND GAMMA RAY LOG
WESTERN PENNSYLVANIA

OBTAINED IN THE EMMA MC KNIGHT WELL NO I
MELBEN OIL COMPANY
PYMATUNING TOWNSHIP, MERCER COUNTY, PA.

WALTER R. WAGNER, 1957

Plate 2

Table 3, Summary of deep well completions, Pennsylvania 1958

	Development	Development	Development	Wildcat	Wildcat	Wildcat	Total
Oil	1			1			2
Gas		67			9		76
Dry			25			17	42
Footage	3853	492,896	171,208	3886	55,287	100,513	827,643

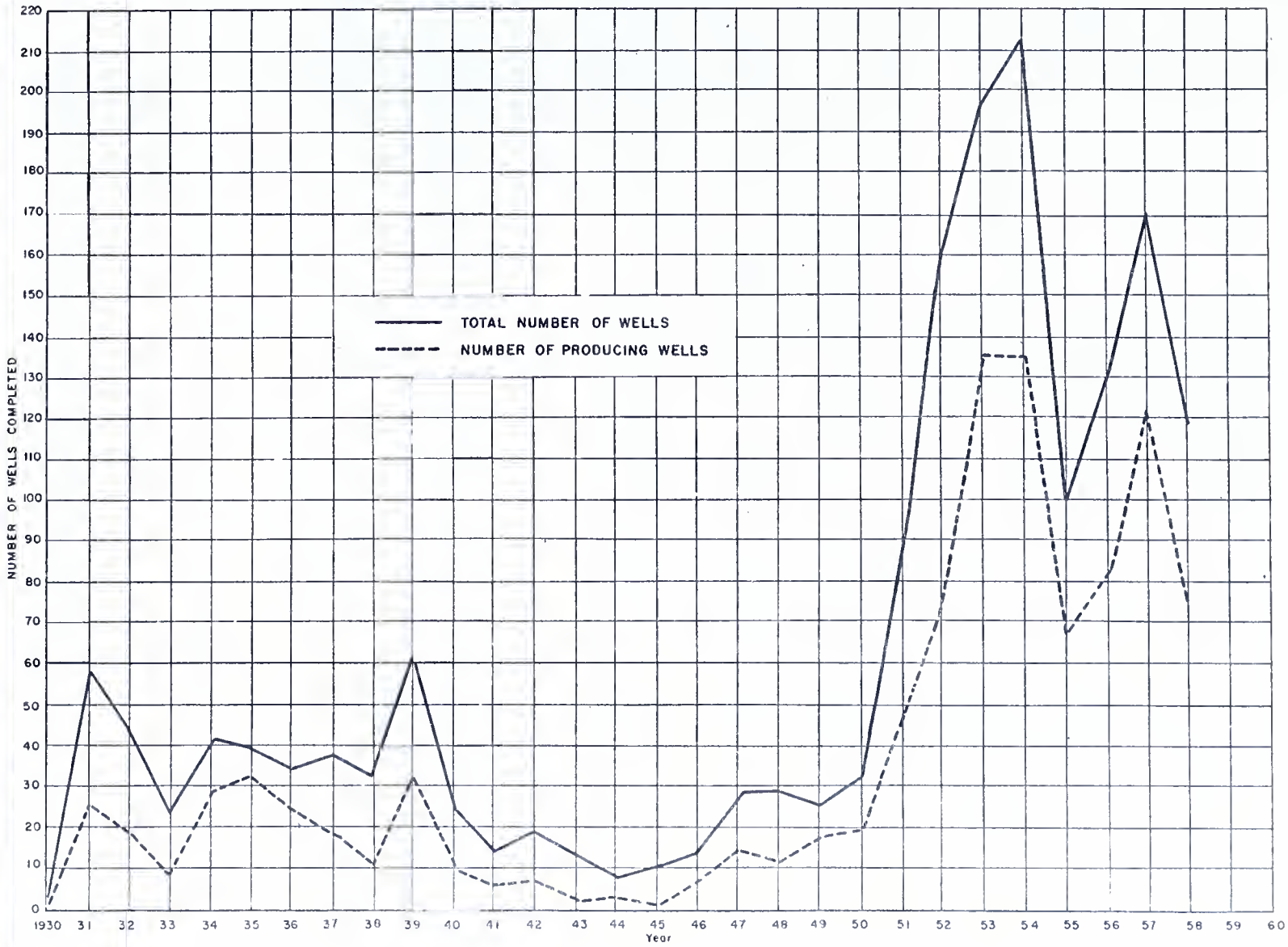
Summary of Recent Developments Along Chestnut Ridge

The area in Pennsylvania in which the greatest number of deep development wells for gas production were drilled in 1958 was on the northwest flank of Chestnut Ridge Anticline, in Clearfield County. (A structure contour map (plate 5) of the producing area along this trend is included in this Progress Report).

Production along this trend in the area referred to above, and on the map, is from the Onondaga chert and the immediately underlying Ridgeley sandstone. (A stratigraphic correlation chart of this part of the section encountered in four widely spaced wells in the area is included herewith). The term "Ridgeley" is used in this summary report for a special reason. The Ridgeley Formation has been defined as the upper of two formations comprising the Oriskany Group; beneath the Ridgeley the Shriver Formation may be found, and below that, the Helderberg Group. The coexistence of the Ridgeley and Shriver is well established in the outcrop section about 40 miles to the east of the Chestnut Ridge Anticline. But in the subsurface section it has been difficult to identify the Shriver and to differentiate it from rocks which belong to the Helderberg Group. Because the area of western Clearfield County is one in which our inability to clearly differentiate between Shriver and Helderberg may be important, and because the use of the more inclusive term "Oriskany" might imply the inclusion of the Shriver, it has been deemed advisable to be more specific and restrictive with the term "Ridgeley".

Two pools of accumulation exist in the area covered by the map, a low structural saddle defining the boundary between the pools. The southern pool, and the first discovered (1953), is the Reed-Deemer Pool; it appears that there will be little additional development drilling to further exploit this accumulation. The northern pool is the Rockton Pool; its boundary at the northeast has not yet been defined by the operators who are still active in the area.

Gas production from the Onondaga-Ridgeley interval is controlled by both structural and stratigraphic features. The pools are located on the northeastern flank of the Chestnut Ridge Anticline. The influence of structural conditions in the region is also to be observed in the very complex pattern of faulting encountered in the subsurface. The up-dip boundary of the pools is controlled, in a regional sense, by the absence of commercially effective porosity and permeability in that direction. Whether this characteristic of the Onondaga-Ridgeley interval is a primary (depositional) or secondary (post-depositional) feature of the sediments is a matter not yet agreed upon by local geologists. In effect, the accumulations are stratigraphic traps, with complications contributed by faulting.



ANNUAL RATE OF DEEP SAND EXPLORATION AND DEVELOPMENT

Figure 1

The faulting encountered in the subsurface in this region has been exclusively of the reverse type - high angle faults, approximately parallel to each other and to the structural trend. There has been no reported instance of a section in any well which is shortened, or cutout, because of normal faulting. On the contrary, a large part of the evidence for reverse faulting is the numerous instances of repeated intervals in many of the wells. The existence of a set of a regional "master" fault or faults systems, is not apparent. Interpretations of the pattern of faulting in this area vary, but all agree to the extent that it is complex. And it also is an accepted hypothesis that some faults are important in separating areas of different production characteristics. The magnitude of displacement, however, rarely exceeds more than 100' (measured vertically), and in only a few instances can the failure of a well to produce, that is so to speak, "on trend", be ascribed to faulting. As a general rule production has been obtained in wells which found the top of the Ridgeley sandstone at elevations ranging between 5300' and 5700' below sea level.

When considering the stratigraphic nature of the producing interval apart from influences of structure several interesting features may be noted. The producing interval, as previously mentioned, consists of the Onondaga chert and Ridgeley sandstone - the former immediately above the latter. In most wells the first appreciable show of gas while drilling is not encountered until the sand is reached, and it is only after fracturing the whole interval that the chert section yields a significant flow of gas. Furthermore, it has been noted that if the sandstone is very thin or absent, tightly cemented, or with abundant interstitial material - in other words, if it is an ineffective reservoir, the chert section is incapable of serving alone as a potential reservoir. This observation leads to the conclusion that the sandstone must, in this area, serve as a transmission agent allowing the accumulation of gas in favorably located pools. Studies attempting to measure the amount of gas which migrates into the chert section, either before or after fracturing, have not, as far as is known, produced significant conclusions.

Little attention has been given to a stratigraphic study of the Onondaga Group along Chestnut Ridge Anticline. Lack of data makes difficult, if not impossible, the defining of the gas producing zone (or zones) within the chert, and insufficient stratigraphic detail is responsible for the hazy understanding of relationships between the limestone-chert facies of the Appalachian Plateau and the shale facies of the Ridge and Valley Province. To solve these and other problems relating to the Onondaga a study of that group has been initiated. Because this study is yet in the embryonic stages, correlations are tentative and are not to be considered final. (See plate 6 for the correlation of the columnar sections of four wells in the Penfield and Punxsutawney Quadrangles). A generalized description of the units used is given below:

HAMILTON GROUP - Shale, dark-gray to black, largely calcareous

ONONDAGA GROUP

Onondaga "limestone" (thickness 6-15 feet)

Unit No. 5 — Limestone, fine-grained, shaly to clastic, dark-gray, commonly fossiliferous and occasionally silty; a great deal of grayish-black to black, calcareous shale; a one foot (plus or minus) bed (or beds?) of dark-brownish- to brownish-gray micaceous metabentonite and metabentonitic shale. The metabentonite appears to be variable

in both thickness and stratigraphic position. Within the area under discussion it can be found anywhere from 10 feet above the top of the limestone to a few feet below the top of the chert, and the variable thickness may be attributed, on large part, to caving from above and large sampling intervals.

Unit No. 4 — Onondaga "chert" (thickness 54-90 feet)
Chert, light-gray, chalcedonic to subchalcedonic, in part calcareous; some dark-gray- to grayish-black, argillaceous chert, thickness 10 to 20 feet.

Unit No. 3 — Chert, dark-gray- to grayish-black, argillaceous, some light- to medium-gray, granular to subchalcedonic chert; variable amounts of siliceous and non-siliceous, grayish-black shale, thickness 20 to 25 feet.

Unit No. 2 — Chert, brownish- to medium-light-brownish-gray, subchalcedonic to subgranular; some dark-gray, argillaceous chert; minor grayish-black, siliceous shale, thickness 9 to 27 feet.

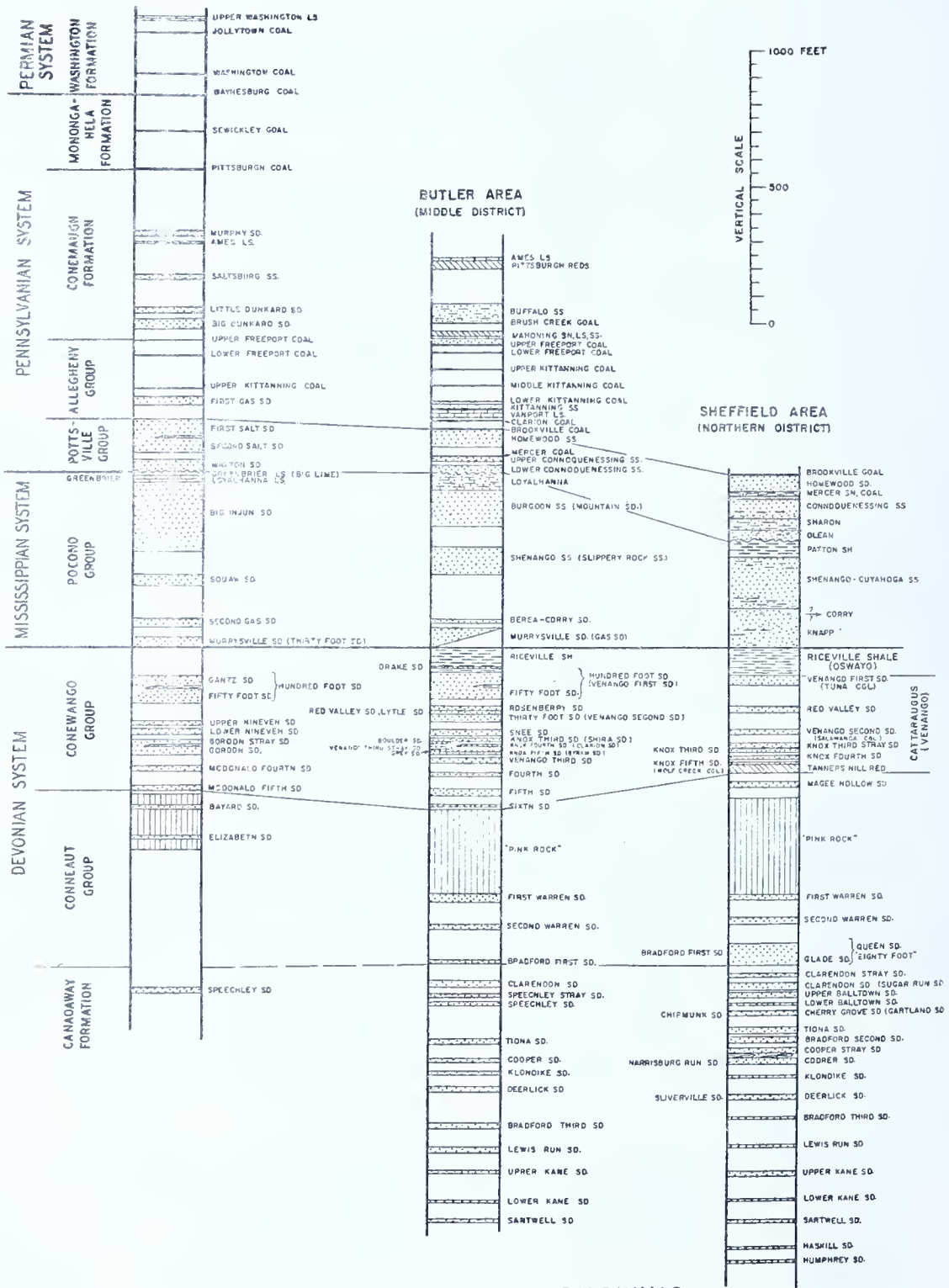
Unit No. 1 — Chert, dark-brownish-gray to dark-gray, argillaceous, grading into dark-gray- to grayish-black, siliceous shale in lower part, thickness 15 to 25 feet.

ORISKANY GROUP

Ridgeley Sandstone
Sandstone, quartzose to quartzitic, medium- to coarse-grained, rounded to well-rounded with some secondary crystal faces, light-gray; siliceous cement at top which in part, is replaced by calcite cemented toward base, thickness 2 to 13 feet.

An isopach map of the Ridgeley sandstone (not included in this report) indicates that the trend of sand development is coincident with the belt of producing wells and is approximately a straight line, in an approximately northeast-southwest direction. At right angles to this trend the change in thickness of the sand is also quite regular and constant in the area - about 15' per mile. In Penfield Quadrangle there are no producing wells along the up-dip boundary of production with a sand thickness less than 5', and most of the wells report more than 10' of sand. In Punxsutawney Quadrangle, on the other hand, where the average production per well has been not as great as in Penfield, the sand thickness averages about 7' in the producing wells. It should also be pointed out, in passing, that in Punxsutawney Quadrangle, production is obtained much closer to the crest of the anticlinal fold than is the case in Penfield Quadrangle.

Attempts to correlate in a general way the production characteristics with sand thicknesses have been inconclusive, except in one instance. In the Homecamp Area (northwestern Union Township) the average initial open flow potential (after fracturing) of the wells has been much higher than anywhere else in the area; initial open flows in excess of 60,000,000 cubic feet have been gauged in two wells. This area of flush production coincides with an area in which a concentration of sand exceeding 20' in thickness has been found (in an up-thrown fault block). Evidence also points to the fact that there may have been originally a



COLUMNAR SECTIONS SHOWING STRATIGRAPHIC POSITIONS OF OIL AND GAS SANDS OF WESTERN PENNSYLVANIA

JOHN W. BERGSTEN, 1937

Plate 3

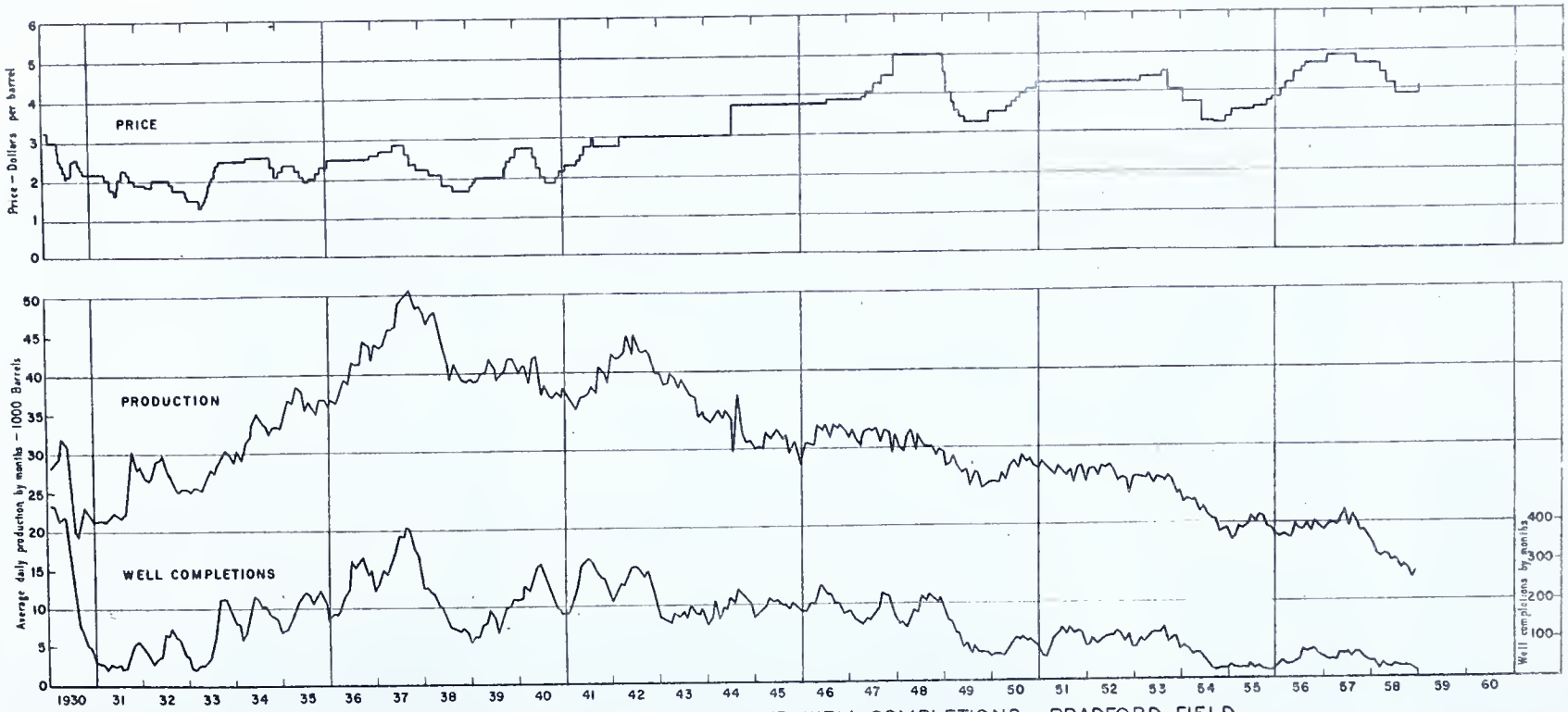
depositional environment, such as a sheltered embayment protected by a high promontory, which encouraged the accumulation of sand in that locality. Such a promontory might have prevented the removal, or at least the more even distribution, of the sand deposit by laterally moving currents. And subsequent winnowing action may have permitted the sediments to develop the optimum characteristics of a reservoir rock.

The average initial open flow potentials (after fracturing) in the Reed-Beemer and Rockton pools are, as was mentioned earlier, somewhat different. In the Reed-Beemer Pool initial potentials have averaged about 1,500,000 cubic feet per producer and the original rock pressure was about 3850 lbs. In the Rockton Pool open flows have averaged about 2,800,000 cubic feet per producer and the original pressure was about the same as in the other pool. Production histories over a period of years is not now available. As stated before, development drilling at the north end of the Rockton Pool is still going on.

Activities In Other Fields

Pennsylvania's first offshore well in Lake Erie on Block No. 1 (see plate 4) drilled by New York State Natural Gas Corp., was located with subsurface geology. It was completed after fracturing the Medina section. Production amounted to 200 MCF of gas with a rock pressure of 510 p.s.i. in 24 hrs. The well was completed at a total depth of 5098 ft. in the Upper Cambrian and has been shut in with the master gate on the lake floor. Additional information on this Block One pool well hasn't been released. In the spring of 1959 a second offshore well will be drilled by the same company on Block No. 2. F. Pierce No. 1, the second well in the pool, was drilled south of Block No. 1 well, and was completed in the Medina section with an open-flow of 780 MCF of gas after fracturing, and a rock pressure of 855 p.s.i. (plate 4 and table 1). Six other wells were drilled in Erie County during the year. One well, the Edna Roberts No. 1 by Britton et al, was the discovery well in the Roberts pool. Production amounted to 2,200 MCF of gas per day, and a rock pressure of 930 p.s.i. in 68 hrs. after fracturing the Medina section. The other five wells were dry holes. Two of these bottomed in the Helderberg, one in the Salina, and two in the Queenston (Upper Ordovician). C. A. Blass No. 1 well by Chas. Siegel in McKean Township, Erie County was reactivated during the year. This well found 106 MCF of gas daily, after fracturing the Medina Section, with a rock pressure of 900 p.s.i. This Blass pool discovery well was completed in the Queenston at a depth of 3282 ft.

The Joe Kardosh No. 1 well by M. L. Benedum, located with subsurface data and drilled in Crawford County (plate 1 and table 1), is the first well drilled to basement in western Pennsylvania. The well was dry at a total depth of 8030 ft. in Pre Cambrian granite wash. No additional information has been released on this wildcat. Two wells were drilled in the Forro pool. The discovery well, Lewis Forro, Jr. No. 1 by Felmont Oil Corp., reached the Queenston at a total depth of 3886 ft. Production amounted to 27 bbl. of oil daily and 300 MCF of gas from the Medina section. The second well in this pool is the Harry J. Wigand No. 1 by the same company. The well has been shut in after an initial production of two bbls. of oil per day, and and open-flow of 125 MCF of gas. Two other wells in this county reached the Queenston, after encountering shows of gas and oil in the Medina section, and were abandoned. Another well found a show of oil in the Oriskany and was abandoned.



CRUDE OIL PRICES, PRODUCTION AND WELL COMPLETIONS – BRADFORD FIELD

Figure 2

A well in the Bingham Center Oriskany gas pool of Tioga County, was temporarily abandoned as a dry hole in the Onondaga. Two gas wells were completed in this county in the Ellisburg Oriskany gas pool.

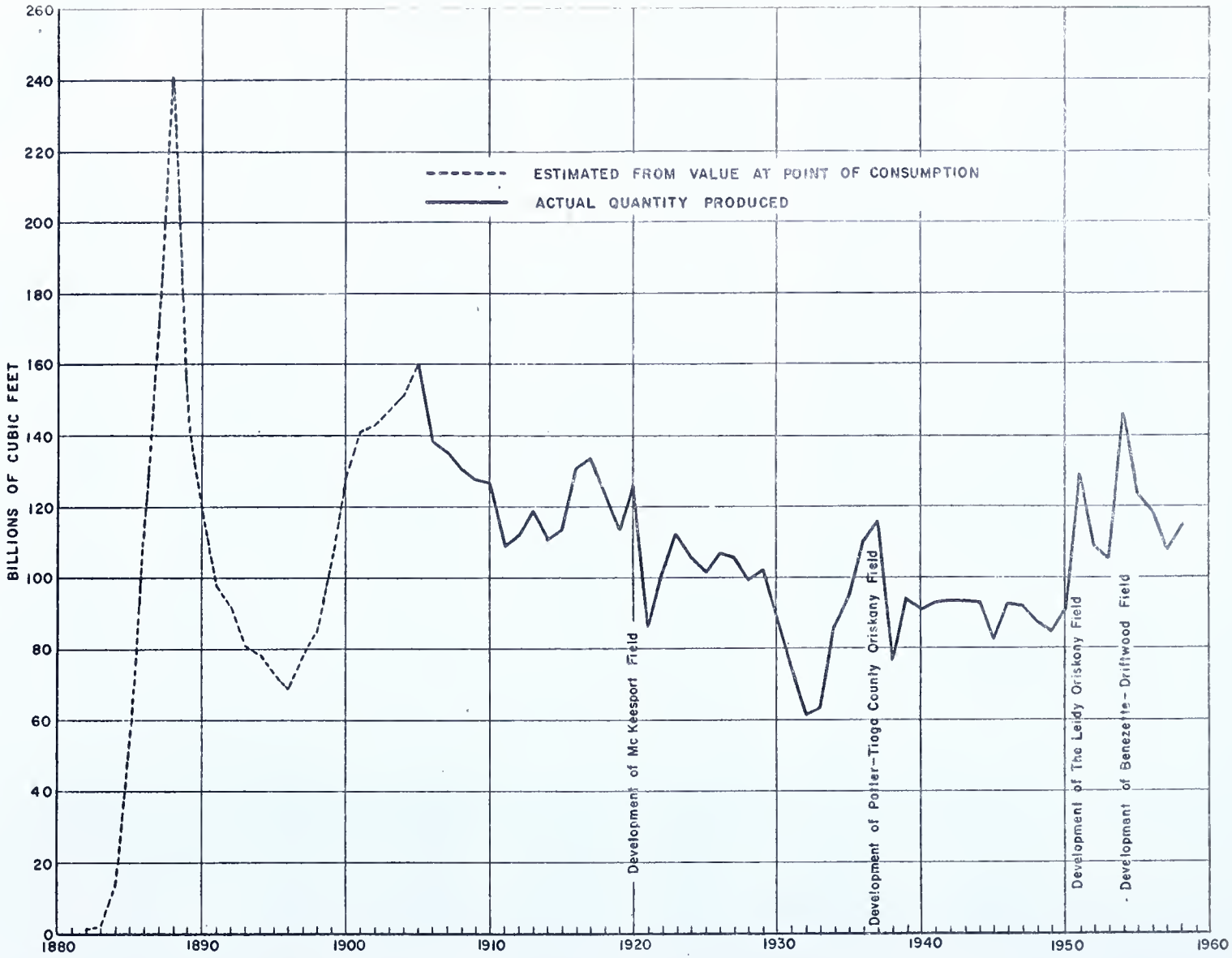
One gas well was completed in the Greenlick pool, Leidy field, Potter and Clinton counties. Development drilling in this pool is about completed. Production amounted to 3,000,000 MCF of gas for the year. The cumulative total production was 47,000,000 MCF at the end of 1958. Production from the Tamarack and Downs pools of 48,000 MCF of gas made the cumulative total 11,400,000 MCF of gas while the Leidy pool produced 479,000 MCF of gas with a cumulative total of 94,000,000 MCF. The cumulative total for these four pools in the Leidy Field as of January 1, 1959 was 152,400,000 MCF of gas. Two new pool wildcats were drilling to the northeast of the Leidy pool at the years end.

In the Benezette-Driftwood field the Hicks Run pool had a dry hole drilled on its northern boundary. To date this pool has produced 1,800,000 MCF of gas. The Benezette-Driftwood pool had eight completions of which four were gas wells and four were dry holes. This pool produced 7,000,000 MCF of gas during the year from the Oriskany. The cumulative production amounted to 212,000,000 MCF. This makes a cumulative production figure of 213,800,000 MCF for the Benezette-Driftwood field.

In the fall of the year a new pool wildcat discovered Oriskany sand on the southeastern flank of the Sabinsville Anticline in northwestern Clearfield County after a well drilled previously on the axis of the anticline found the Oriskany absent. This discovery well of the Tract 65 pool, Boone Mountain field, is No. 1 well on Tract 65 by New York State Natural Gas Corp. It was located with surface and subsurface geology. The well produced 6,501 MCF of gas daily after fracture at a rock pressure of 3703 p.s.i. in 112 hrs. By the end of the year seven producing gas wells had been drilled with an average initial open-flow capacity of 3,339 MCF after fracturing (table 1 and plate 5). At the start of 1959 a number of development wells were drilling in this pool.

The Rockton Onondaga chert-Oriskany Sandstone gas field of northwestern Clearfield County (plate 5), continued to be the center of the development drilling activity in the state. Thirty-two gas wells and 11 dry holes were drilled during the year. The 32 gas wells had average initial open-flow capacities after fracturing of 4,489 MCF of gas per day. A successful outpost well, No. 4 Tract 76 by Manufacturers Light and Heat Co., extended the field to the northeast. The open-flow of this well was 12,800 MCF of gas after fracture and the rock pressure was 3700 p.s.i. in 72 hrs. The Emery Miller No. 2 well was the largest well drilled during the year in the field with an initial open-flow capacity of 20,000 MCF of gas per day. By the end of the year the developed area included about 11,000 acres. To the southwest the Reed-Deemer field (table 1, plate 5), along the same trend (Chestnut Ridge Anticline), had a dry hole completion. The developed area is about 4,000 acres. The gas production from the Luthersburg area which includes the Rockton and Reed-Deemer fields, amounted to 28,000,000 MCF for the year. The cumulative production for this area as of January 1, 1959 was 61,000,000 MCF of gas.

Armstrong County had its first deep sand production when the Margaret Rupert No. 1 well, a new pool wildcat by Columbian Carbon Co., discovered gas in the Onondaga chert-Oriskany Sandstone section. The well had an initial open-flow capacity of 3,477 MCF of gas after fracturing. This Rupert pool in the Girty field had no new locations at the end of the year.



ANNUAL PRODUCTION OF NATURAL GAS IN PENNSYLVANIA

Figure 3

In southwestern Indiana County the Jacksonville Onondaga chert-Oriskany Sandstone field had four gas wells and three dry holes completed during 1958. The average initial open-flow capacities of the four gas wells was 2,910 MCF per day after fracturing. This field produced 3,500,000 MCF of gas during the year making the total cumulative production since the discovery in 1956 of 10,000,000 MCF.

The Nolo Onondaga chert-Oriskany Sandstone gas field, located in Indiana County on the Nolo Anticline was the second most active field development in the state during 1958. Twelve gas wells and 2 dry holes were completed during the year. The average initial open-flow capacities of the 12 gas wells was 4,592 MCF per day after fracturing.

In the McCance field, Westmoreland County, a new pool wildcat in the Onondaga chert was completed with an open-flow potential of 1,087 MCF of gas and a rock pressure of 3,250 p.s.i. in 10 days. This well, located with seismic, surface geology, and subsurface geology data, was the Latrobe Construction Co. No. 1 well by the Peoples Natural Gas Co., drilled in the Derry pool on the Chestnut Ridge anticline. In the southern part of the county the St. Boniface Chapel pool had four completions, three of which were gas wells with average open-flow capacities of 1434 MCF per day. The fourth well was completed as a dry hole. A new field wildcat in Westmoreland County, located with seismic, surface geology, and subsurface geology data, discovered one of the two new deep gas fields discovered in the state during the year. The new field is in the southeastern corner of the county. The discovery well was the James S. Blair No. 1 well by the Peoples Natural Gas Co., drilled on the Seven Springs Anticline. The well produced 3,663 MCF of gas natural from the Onondaga chert at a rock pressure of 3,250 p.s.i. in 10 days; discovering the Seven Springs field. A confirmation well was being drilled by the end of the year.

In Somerset County a new field and a new pool were discovered in 1958. The new field, the Boswell field, was discovered by the Royal Rhodes et al No. 1 well drilled by Felmont Oil Corp., and Peoples Natural Gas Co., on the Boswell Dome. This well, located with seismic and surface geology information, found gas in the Oriskany at a depth of 8,420 ft. to become the deepest producing well in Pennsylvania. The initial open-flow capacity was 3,100 MCF of gas with a rock pressure of 3,602 p.s.i. in 116 hrs. In the northwestern corner of the county in the Johnstown field the new Williams pool was discovered on a seismic prospect when C. E. Williams No. 1, by Peoples Natural Gas Co., was drilled on the Laurel Hill Anticline finding gas in the Onondaga chert-Oriskany Sandstone section. The open-flow potential of this well was 16,025 MCF of gas with a rock pressure of 3,660 p.s.i. in 72 hrs. after fracturing. Two additional gas wells were completed in this pool during the year.

Eight important unsuccessful widely scattered new field wildcats were drilled in Pennsylvania during 1958 (plate 1 and table 1). One unsuccessful test was completed in each of Juniata, Luzerne, McKean, Pike, and Wayne Counties. The William Rambler No. 1 well in Juniata County in the closely folded Appalachian Mountains found the Oriskany at 1,307 ft. and bottomed in Lower Wills Creek (Upper Silurian), at 5,205 ft. The Goodwin No. 1 in Luzerne County found the Tully at 4,440 ft. and was completed in the Hamilton (Middle Devonian). Lot 4, No. 1 well in McKean County was abandoned after finding saltwater seven feet in the Oriskany. This well was located on subsurface information. The Walker Hess No. 1 well in Pike County was completed in the Helderberg after finding

Table 4. Shallow-Sand Well Completions in Pennsylvania in 1958 *

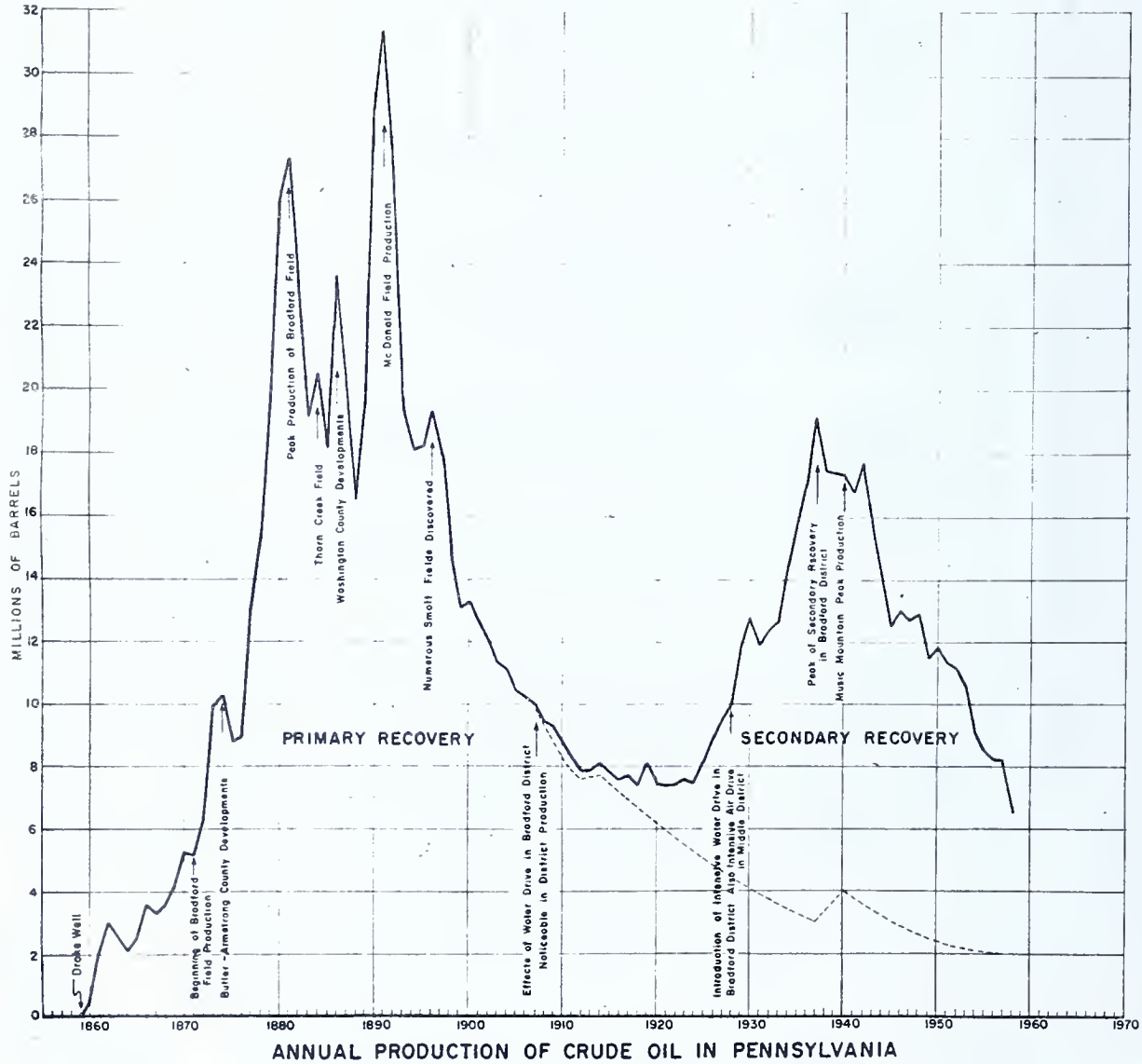
County	Total		Gas			Oil			Dry	
	No. of Wells	Aver. Total Depth (Feet)	No. of Wells	Aver. Init. Open Flow (M.Cu.Ft. Per Day	Aver. Total Depth (Feet)	No. of Wells	Aver. Init. Prod. (Bbls. per Day)	Aver. Total Depth (Feet)	No. of Wells	Aver. Total Depth (Feet)
Allegheny	1	3550	1	36	3550	--	--	--	--	--
Armstrong	124	3062	119	600	3151	--	--	--	5	2934
Butler	2	2784	1	10	3642	--	--	--	1	1925
Clarion	28	2563	22	352	2501	--	--	--	6	2791
Clearfield	2	1760	--	--	--	--	--	--	2	1760
Elk	12	2374	9	972	2401	--	--	--	3	2292
Fayette	2	1619	1	75	2098	--	--	--	1	1140
Forest	19	1178	4	46	2022	7	2.7	742	8	1138
Greene	1	1857	--	--	--	--	--	--	1	1857
Indiana	44	3264	37	536	3230	--	--	--	7	3444
Jefferson	38	3003	33	473	3018	1	2	1204	4	3151
Lackawanna	2	3863	2	57	3864	--	--	--	--	--
McKean	4	1555	--	--	--	3	2	1714	1	1078
Potter	4	2027	4	17	2024	--	--	--	--	--
Tioga	2	1401	--	--	--	--	--	--	2	1401
Venango	9	885	--	--	--	6	.5	960	3	735
Warren	7	893	--	--	--	7	6.2	894	--	--
Washington	2	2780	2	505	2781	--	--	--	--	--
Westmoreland	24	3059	23	741	3041	--	--	--	1	3477
Wyoming	1	3966	--	--	--	--	--	--	1	3966
Total	328	2774	258	550	3021	24	2.9	1011	46	2306

* Does not include wells drilled in connection with underground storage or secondary-recovery oil operations

Table 5. Shallow-Sand Wells Deepened in Pennsylvania in 1958 *

County	Total		Gas			Oil			Dry	
	No. of Wells	Aver. Amount Deepened (Feet)	No. of Wells	Aver. Init. Open Flow (MCF per Day)	Aver. Amount Deepened (Feet)	No. of Wells	Aver. Init. Prod. (Bbbls. per Day)	Aver. Amount Deepened (Feet)	No. of Wells	Aver. Amount Deepened (Feet)
Allegheny	2	932	--	--	--	1	4	556	1	1308
Armstrong	9	1638	9	562	1638	--	--	--	--	--
Forest	3	532	3	27	532	--	--	--	--	--
Greene	2	750	2	42	750	--	--	--	--	--
Indiana	3	867	3	363	867	--	--	--	--	--
Jefferson	1	500	1	16	500	--	--	--	--	--
Lackawanna	1	452	1	52	452	--	--	--	--	--
Totals	21	1108	19	336	1126	1	4	556	1	1308

* Does not include wells drilled in connection with underground gas storage or secondary-recovery oil operations



ANNUAL PRODUCTION OF CRUDE OIL IN PENNSYLVANIA

Figure 4

the Oriskany dry. The Clarence Price No. 1 well in Wayne County, after finding the Oriskany absent, bottomed in the Bossardville (Upper Silurian), at a total depth of 8,740 ft.

Three wildcats in Somerset County were unsuccessful. Pa. Tract 75, No. 1 well was located with seismic information and drilled on the southeast flank of the Seven Springs Anticline and abandoned. This well probably bottomed in the Genesee (Upper Devonian) after drilling through 7,936 ft. of sediments. Milton E. Bender No. 1 well, located with seismic information and surface geology, and drilled on the Negro Mountain Anticline, found gas in the Onondaga chert and salt water in the chert and Oriskany. After working with this well for some time, it was abandoned. Pa. Tract 64, No. 1 well, also drilled on the Negro Mountain Anticline, was dry in the Onondaga and Oriskany section, and was abandoned. This well was located with seismic information and surface geology.

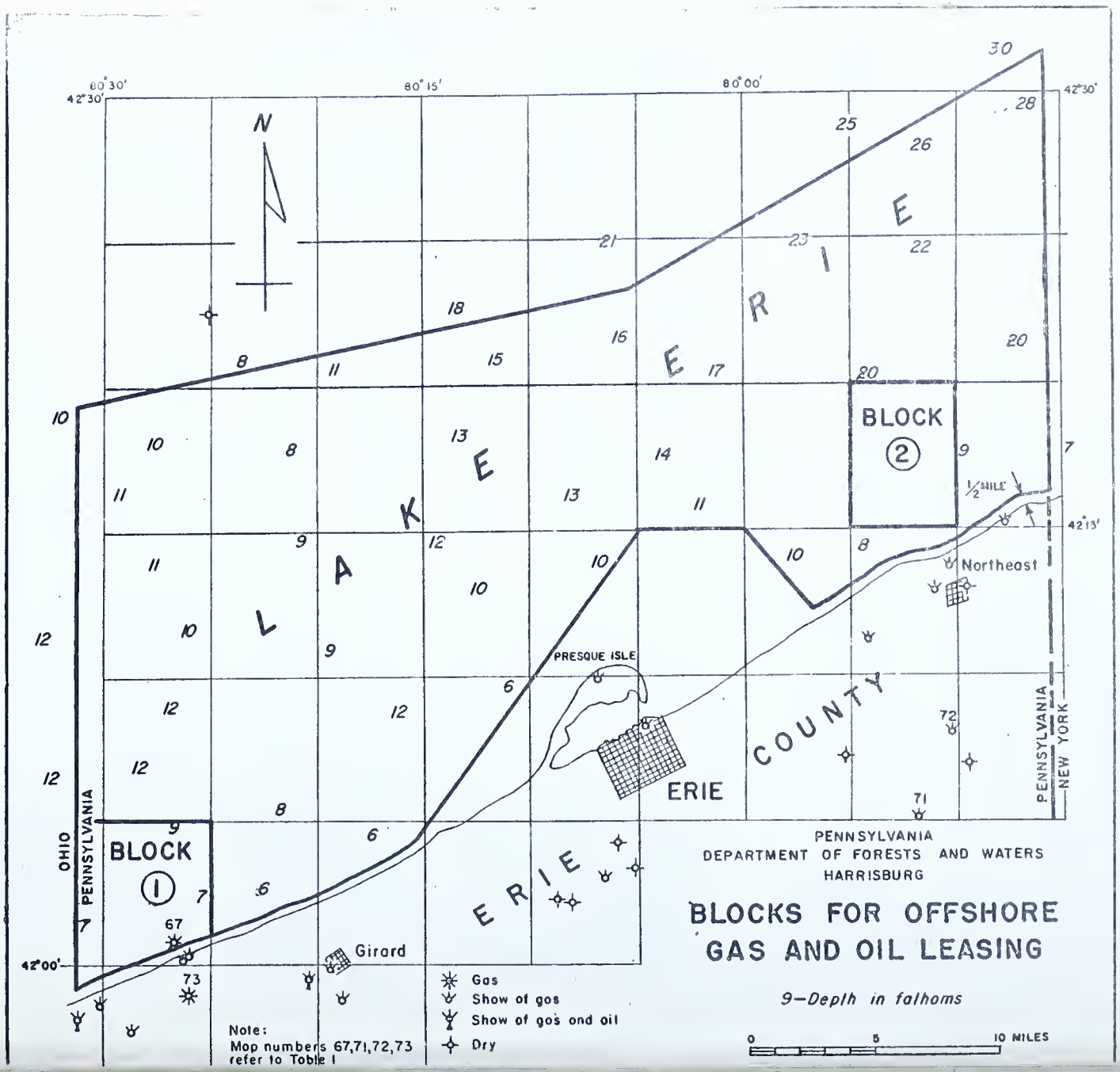
On sheet 13 table 1 are listed six deep wells which were reactivated during the year and their operations completed. One well, the C. A. Blass No. 1 in Erie County, was a new pool discovery. The total footage drilled by these wells was 330 ft. including the Blass well

SHALLOW-SAND DEVELOPMENTS

Drilling activity in the shallow-sand territory of western Pennsylvania (Upper Devonian or younger) showed a marked decline during 1958 over that of 1957. This decline was due mostly to the unstability of the crude oil market during the year. In all, 668 shallow-sand wells were completed, as compared with 955 in 1957. Of these, 258 were gas wells, 24 were oil wells, 46 were dry holes, and five were drilled for underground storage of gas. Twenty-one wells were deepened outside of the secondary-recovery operations. Drilling in connection with secondary-recovery oil operations amounted to 335 new wells and an additional 17 wells were drilled deeper. The total footage for the new and deepened wells was 1,511,911 ft.

Shallow-sand well completions in western Pennsylvania, exclusive of those drilled in connection with underground gas storage or secondary-recovery oil operations, are shown in table 4. Table 5 shows the results obtained by deepening 21 shallow-sand wells in 1958. The stratigraphic positions of the Upper Devonian and younger oil and gas sands of western Pennsylvania, from southwest to northeast along the trend of the producing belt shown in plate 1, are illustrated in the three columnar sections appearing in plate 3. On the Butler Area (Middle District) columnar section, the sands shown as Cooper Stray, Cooper, Klondike, Bradford Third, Lewis Run, Upper Kane, Lower Kane, and Sartwell, are usually called Upper Balltown, Lower Balltown, Sheffield, Second Bradford, Third Bradford, First Kane, Second Kane, and Third Kane respectively by the drillers.

The total initial open-flow capacity of the 258 new gas wells amounted to 142,357 MCF per day, as compared with the total initial open-flow capacity of 138,329 MCF per day for the 210 gas wells completed in 1957. The figures used for 1958, as well as 1957, are those that were obtained after fracturing where that method of well completion was employed. Of the 258 new gas wells completed, 192 were fractured. The combined initial open-flow capacity of the 192 wells was 128,178 MCF per day after fracturing, as compared with 8,958 MCF per day before fracturing. Of the 19 gas wells deepened, 13 were fractured. The combined initial open-flow capacity of these 13 wells was 6,061 MCF per day after fracturing as compared with 421 MCF daily before fracturing. The 24 new oil wells completed in 1958 had a total initial production of 71.7 barrels of crude oil per day, as compared with the total production of 175.8 barrels per day for the 48 new wells completed in 1957.


80°30'
80°15'
80°00'
42°30'
42°15'
42°00'
N
LAKE ERIE
BLOCK 1
BLOCK 2
PRESQUE ISLE
ERIE
COUNTY
PENNSYLVANIA
OHIO
NEW YORK
Northeast
Girard
1/2 MILE
67
71
72
73
Gas
Show of gas
Show of gas and oil
Dry
Note:
Map numbers 67,71,72,73
refer to Table I
PENNSYLVANIA
DEPARTMENT OF FORESTS AND WATERS
HARRISBURG
BLOCKS FOR OFFSHORE
GAS AND OIL LEASING
9—Depth in fathoms
0
5
10 MILES

Shallow-Sand Gas Developments

The J. Farran well No. 1, drilled by Peoples Natural Gas Co., in Derry Township, Westmoreland County, was completed as a new pool wildcat in the New Alexander gas field. The well produced 3,170 MCF of gas per day from the Balltown sand after fracture with a rock pressure of 1,370 p.s.i. in 24 hrs. The well was completed Oct. 2, 1958, at a total depth of 3376 ft. A second shallow wildcat was successful in Westmoreland County. This was the A. Filander well No. 1, in the Webster field, Rostraver Township, by Peoples Natural Gas Co. The well produced 3,391 MCF of gas per day natural, from the Big Injun sand, with a rock pressure of 400 p.s.i. in one hr. This new pool wildcat was completed at a total depth of 1,558 ft. on Oct. 7, 1958.

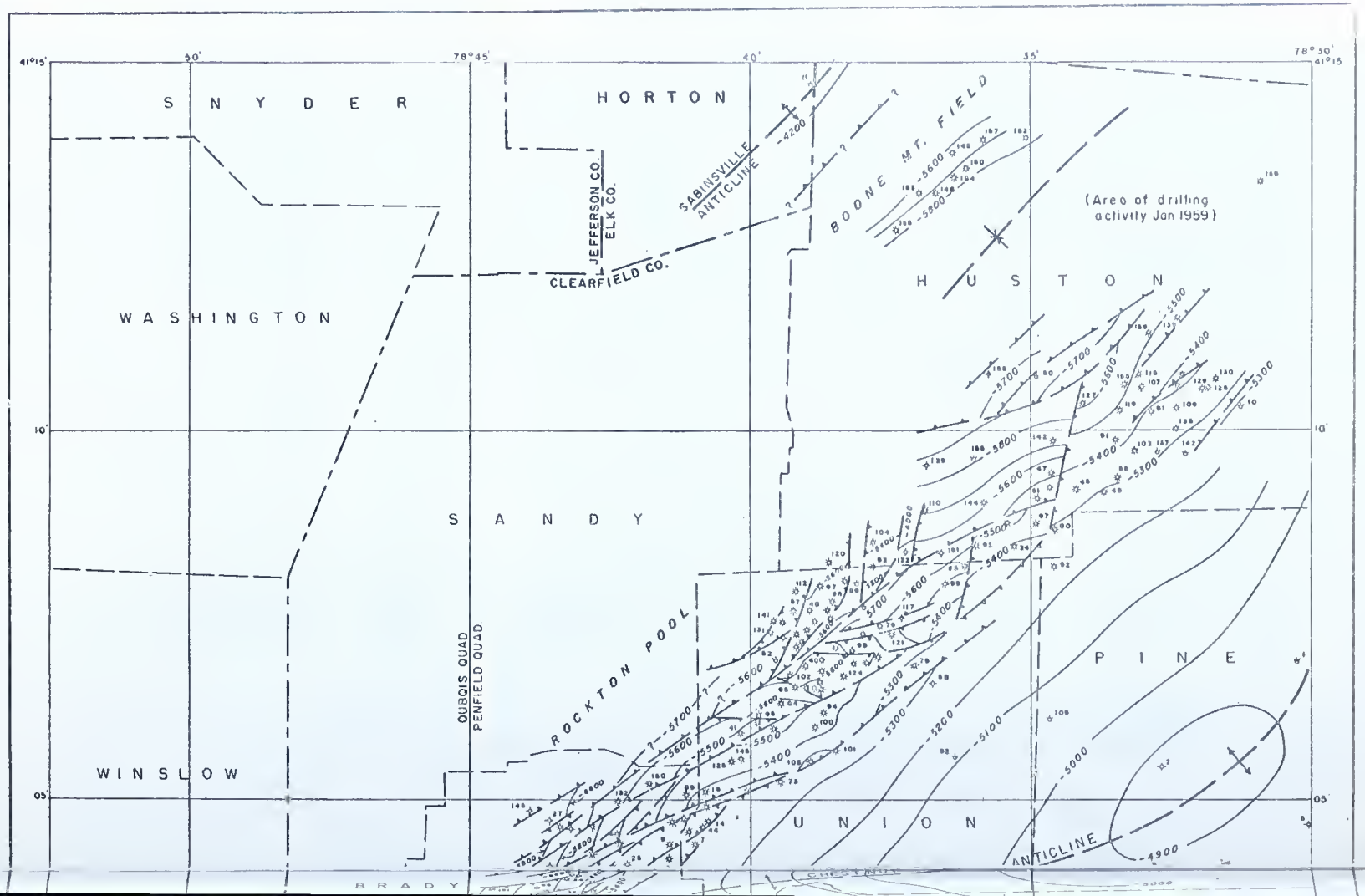
In Elk County the Bond pool in the Boone Mountain field had 10 completions during the year. Five of these 10 wells were gas producers and five were dry holes. One of the producers, the Brockway Crystal Water Co. well, was a successful outpost with an open-flow of 105 MCF of gas daily. At the close of the year this Upper Kane sand pool had a total of eight producing gas wells and seven dry holes. The pool covers about 600 acres.

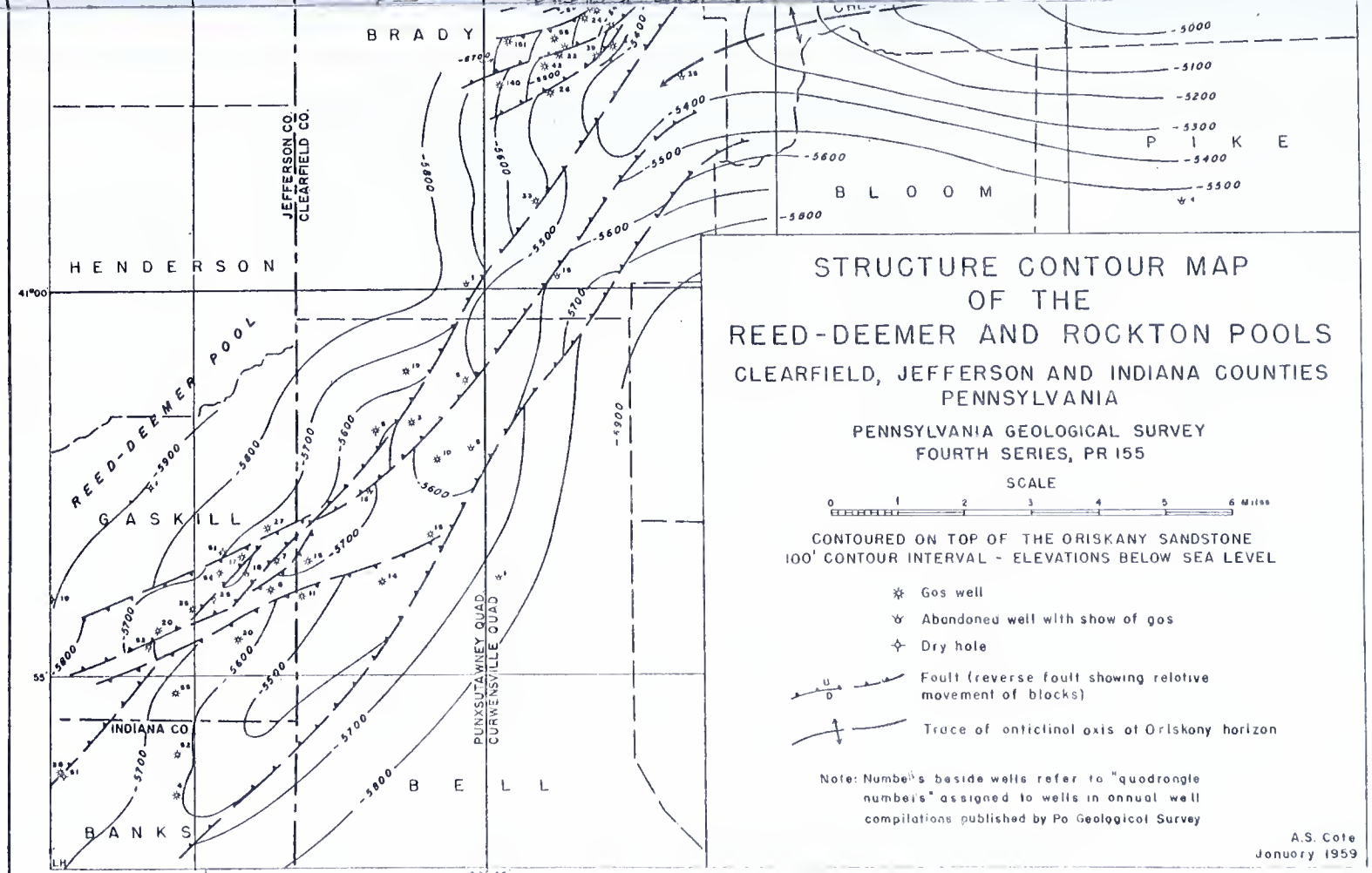
The Speechley and Bradford Third sands continued to be the primary targets for gas production in the shallow-sand fields. Fracturing of these sands continued to play an important roll in increasing gas production. The greatest activity in the shallow-sand gas belt of western Pennsylvania continued in Armstrong County as it had in the two previous years. 119 new gas wells were completed in this county, of which 96 were fractured. Fracturing raised the combined initial open-flow capacities of the 96 new gas wells from 2,092 MCF per day to 69,442 MCF per day, or more than an increase of 33 times. Three other counties had a number of successful gas wells. They are Indiana County with 30 wells, where fracturing increased the production about sevenfold, Jefferson County with 24 wells which were increased about sevenfold, and Westmoreland County with 21 wells which were increased over elevenfold. Five wells were drilled for underground storage of gas; two in the Bunola storage field in Allegheny County, two in the Oakford storage field in Westmoreland County, and one in a Mercer County storage field.

Shallow-Sand Oil Developments

Two counties had seven oil wells drilled within their boundaries aside from the secondary-recovery projects. One county was Forest with an average initial production per well of 2.7 barrels per day. The other county was Warren with an average initial production per well of 6.2 barrels per day.

In 1958 the average daily oil production for Pennsylvania amounted to 17,730 bbls., as compared with 22,495 bbls. in 1956. This decrease of over 21 percent was due mostly to the decrease in production from the Bradford field of over 4,000 bbls., daily. Producers were reluctant to develop secondary-recovery projects in light of the declining price of a barrel of crude. By the end of 1958 refined stocks were down and crude was given a 15 cent raise on Dec. 22. Production should be up in 1959. The fluctuation of crude-oil prices during the year is shown in table 6.


41°15'
50'
78°45'
40'
35'
78°30'
41°15'
S N Y D E R
HORTON
SABINSVILLE ANTICLINE
-4200
BOONE MT. FIELD
-5600
-5800
(Area of drilling activity Jan 1959)
JEFFERSON CO.
ELK CO.
CLEARFIELD CO.
H U S T O N
WASHINGTON
-5500
-5700
-5600
-5400
-5300
10'
10'
S A N D Y
OUBOIS QUAD
PENFIELD QUAD.
ROCKTON POOL
-5000
-5100
-5200
P I N E
WINSLOW
05'
05'
U N I O N
ANTICLINE
-4900
BRADY



STRUCTURE CONTOUR MAP OF THE REED-DEEMER AND ROCKTON POOLS

CLEARFIELD, JEFFERSON AND INDIANA COUNTIES PENNSYLVANIA

PENNSYLVANIA GEOLOGICAL SURVEY
FOURTH SERIES, PR 155

SCALE

0 1 2 3 4 5 6 Miles

CONTOURED ON TOP OF THE ORISKANY SANDSTONE
100' CONTOUR INTERVAL - ELEVATIONS BELOW SEA LEVEL

- Gas well
- Abandoned well with show of gas
- Dry hole
- Fault (reverse fault showing relative movement of blocks)
- Trace of anticlinal axis of Oriskany horizon

Note: Numbers beside wells refer to "quadrangle numbers" assigned to wells in annual well compilations published by Pa Geological Survey

A.S. Cote
January 1959

Plate 5

Table 6. Price per barrel of crude oil, 1958

Date	Northern or Bradford District	Date	Middle or Venango District	Date	Southeastern District
Jan. 1,	$ 4.65	Jan. 1,	$ 4.47	Jan. 1,	$ 4.18
March 1,	4.40	March 1,	4.22	March 1,	3.93
Apr. 15,	4.15	Apr. 15,	3.97	Apr. 16,	3.68
June 16,	3.90	June 16,	3.72	June 18,	3.43
Dec. 22,	4.05	Dec. 22,	3.87	Dec. 23,	3.58
Average	4.13		3.84		3.66

The Bradford, Guffey, and Burning Well pools are included in the Bradford field. Statistics for this field show that 321 new wells were drilled in 1958 in connection with secondary-recovery operations, as compared with 641 in 1957, a decrease of 49 percent. Oil production decreased from a daily average of 19,401 bbls., in 1957 to 14,847 bbls., in 1958, or over 23 percent. Eighty-six percent of the Bradford field is in Pennsylvania. The Pennsylvania part of the field had 289 new wells completed and produced 13,249 bbls. daily of crude oil which represents over 74 percent of the total production in the state for 1958. Crude oil prices, production, and well completions for the Bradford field since 1930 are shown on figure 2.

In other areas where secondary recovery is practiced in Pennsylvania a total of 46 wells were drilled. In the Kane-Clarendon area of southwestern McKean County and eastern Warren County, 28 wells were completed. In the Venango district of northern Venango County and adjacent parts of Warren County, 18 new wells were drilled in 1958, and three wells drilled deeper, as compared with 28 new wells and four oil wells drilled deeper in 1957. Of these 18 wells, 14 were oil wells, 3 air-or-gas-intake wells, and 1 dry hole.

The daily average oil production of the middle and southwestern districts of Pennsylvania was 4,481 bbls., in 1958, as compared with 4,840 bbls., in 1957, a decline of seven percent. In the Clough oil field of central Forest County, there were nine wells drilled. Six of these wells produced oil and the other three were dry holes. No new shallow-sand oil fields or pools were discovered in Pennsylvania during the year. The annual production of crude oil in Pennsylvania since 1859 is shown on figure 4.

GENERAL

As soon as weather permits the drilling of Pennsylvania's second offshore well will get under way. This well will be drilled on block two. The location of the first offshore well in block one, the location of block two, and the locations of three wells completed in the Erie area are shown on plate 4. The records of these wells are shown in table 1.

With the increased interest of major oil companies in the exploration for oil and gas in Pennsylvania, it is very likely that the two bills introduced before Pennsylvania's last legislative session will be re-submitted during 1959. One was a proposal to institute conservation measures in the petroleum industry, the other, a proposal to provide a magnetometer survey of the northwestern part of the state including Pennsylvania's offshore acreage. During the first month of 1959 three major oil companies established offices in Pennsylvania. Other major companies moved men into other states in the Appalachian basin. Current

regulations pertaining to the oil and gas industry in Pennsylvania are Acts 225, 322, 352, and 570, and the rules and regulations of the Sanitary Water Board of Pennsylvania relating to the disposal of waste from oil and natural gas wells.

The Pennsylvania Department of Forests and Waters during 1958 leased by the regular bidding procedure, four parcels of land totaling about 8,000 acres on an exploratory rental basis at an average rental of about eleven dollars per acre. Phillips Petroleum Co., of Oklahoma, leased tracts 81 and 82 in Potter County, totaling 6,452 acres. At the end of the year a wildcat was drilling on each tract. Of the Department's active leases, 12 were tested by drilling 16 producing gas wells and five dry holes during 1958. The Tract 65 pool in the Boone Mountain field was discovered on state land. On the 41 active oil and gas leases on state lands there were 176 producing gas wells at the year's end.

The new deep gas fields and pools discovered in Pennsylvania during the year should see considerable development drilling in 1959. Shallow-sand development drilling should increase during 1959. As in 1957, major Pennsylvania companies kept two seismic crews busy in the western part of the state most of the year.

Table 7 compares the 1958 oil and gas production with that of 1957. As of December 31, 1958, the proven recoverable reserves of crude oil were 120,018,000 bbls. The annual production of natural gas in Pennsylvania is shown on figure 3.

Table 7. Production in Pennsylvania, 1958

	1957	1958	Cumulative total to 12/31/1958
Oil (bbls.)	8,210,000	6,471,680	1,209,070,000
Gas (MCF)	107,004,000	115,000,000	7,181,913,000

Table 8 shows the number of active oil wells and the crude oil produced in Pennsylvania by counties for 1954 through 1957. The total production figures in this table do not agree with production figures as published by the U. S. Bureau of Mines. Although there is an error in the figures, probably due to the duplication by some companies in reporting of crude oil produced, these figures show the trend in production by counties in Pennsylvania.

Table 8. Oil Wells and Crude Oil Production in Pennsylvania by Counties: 1954 to 1957 *

County	1954		1955		1956		1957	
	Number of producing oil wells	Crude oil production (bbls.)	Number of producing oil wells	Crude oil production (bbls.)	Number of producing oil wells	Crude oil production (bbls.)	Number of producing oil wells	Crude oil production (bbls.)
Allegheny	594	129,834	481	134,890	470	127,616	458	132,515
Armstrong	235	14,711	201	15,471	201	14,937	197	13,810
Beaver	205	15,652	178	16,037	182	18,152	182	15,966
Butler	2,989	209,093	2,756	224,748	2,739	216,481	2,689	197,154
Clarion	1,526	55,318	1,357	58,752	1,304	54,096	1,248	53,040
Crawford	662	49,911	672	58,240	649	55,937	618	51,074
Elk	658	27,776	705	32,346	705	32,139	705	30,331
Fayette	7	584	5	436	5	419	4	392
Forest	1,115	115,793	1,089	161,838	1,077	158,404	1,059	152,919
Greene	362	63,676	356	61,884	345	65,164	321	64,310
Jefferson	103	5,322	103	4,965	103	4,490	94	3,938
Indiana	---	---	1	315	1	---	1	---
McKean	34,278	7,245,827	32,553	7,090,225	31,262	6,680,366	31,021	6,616,422
Mercer	242	5,647	237	5,294	237	4,818	229	4,719
Potter	250	117,598	215	81,100	418	116,662	418	95,233
Tioga	16	2,144	16	2,353	16	1,696	16	1,074
Venango	19,188	870,531	19,569	676,460	19,404	630,119	18,732	615,020
Warren	9,403	468,338	9,283	440,572	9,301	377,718	9,256	352,533
Washington	1,029	210,514	933	187,092	927	192,584	903	185,538
Total	72,862	9,608,269	70,710	9,253,018	69,346	8,751,798	68,151	8,585,988

* Data from Bureau of Statistics, Department of Internal Affairs, Pennsylvania

SUBSURFACE STRATIGRAPHY OF ONONDAGA GROUP AND RIDGELEY FORMATION IN NORTHWESTERN CLEARFIELD AND NORTHERN INDIANA COUNTIES

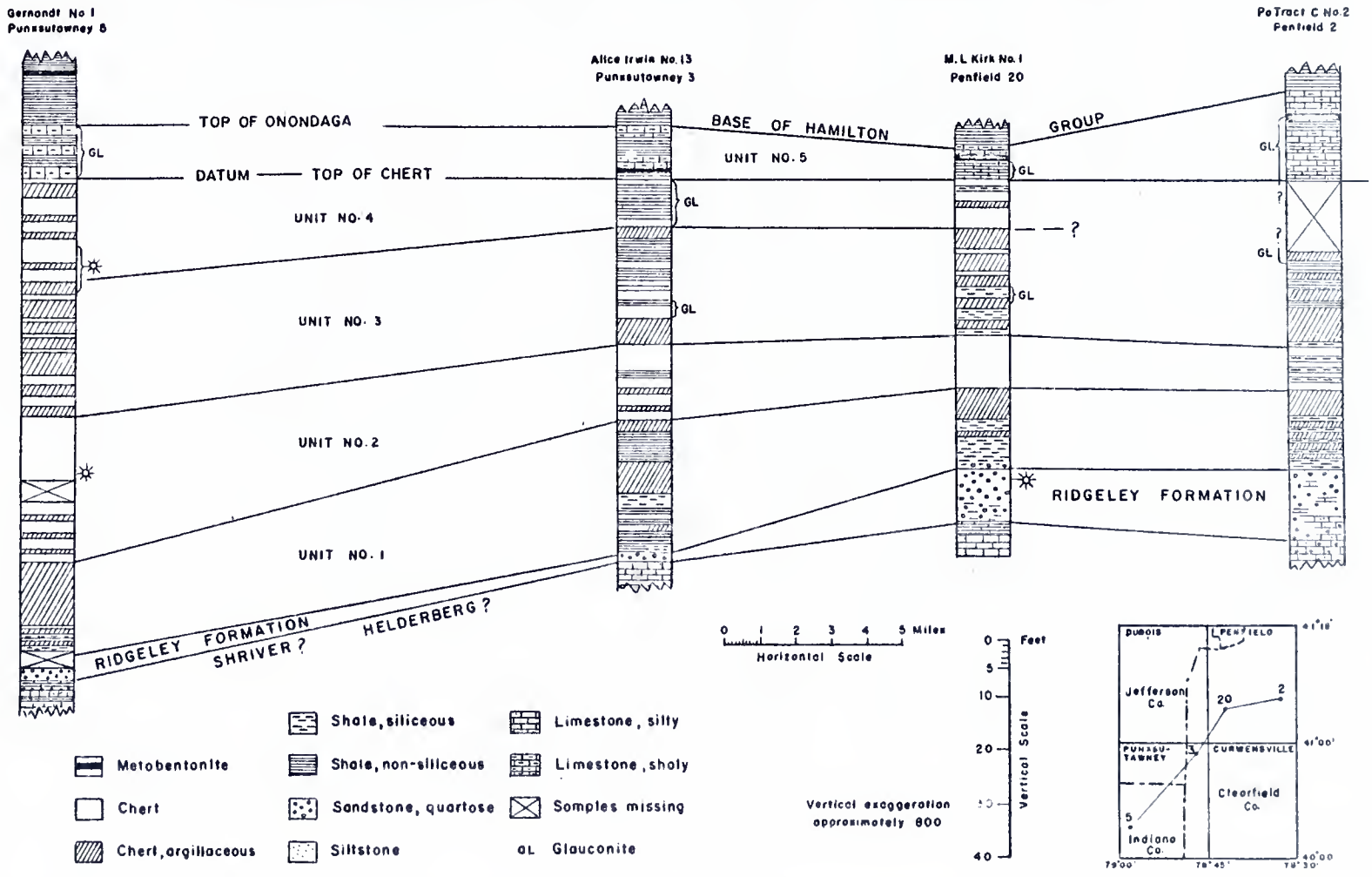


Plate C

W.R. Wagner 1959

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TABLE I SUMMARIZED RECORDS OF DEEP WELLS DRILLED IN PENNSYLVANIA IN 1958

SHEET 1

ELEVATIONS AND DEPTHS ARE IN FEET

COUNTY		Armstrong	Cameron	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield
MAP NUMBER		1	2	3	4	5	6	7	8	9	10
NAME OF WELL		Margoret Rupert 1	A Pardee Est. 2	Baker Run Reserve, No 4	Baker Run Reserve, No 5	Baker Run Reserve, No 6	Baker Run Reserve, No 7	Baker Run Reserve, No. 8	Baker Run Reserve, No 9	Gordon Bender 1	George Bloom 1
OPERATOR		Columbian Carbon Co	Godfrey L Cabot, Inc	F.C. Deemer	F.C Deemer	F.C Deemer	F.C. Deemer	F.C. Deemer	F.C Deemer	Guy F. McCracken et al	John Fox
TOWNSHIP		South Bend	Shippen	Huston	Union	Huston	Huston	Huston	Huston	Union	Union
QUADRANOLE		Elders Ridge 35	Benezette 269	Penfield 120	Penfield 135	Penfield 136	Penfield 144	Penfield 152	Penfield 161	Penfield 124	Penfield 126
LATITUDE		11 mi. S. 40°40'	.64 mi S 41°25'	2.01 mi. S. 41°10'	.42 mi. S. 41°10'	.52 mi. S. 41°10'	1.10 mi. S 41°10'	1.86 mi. S. 41°10'	1.87 mi. S 41°10'	1.94 mi. N 41°05'	.60 mi. N. 41°05'
LONOITUOE		50 mi E. 79°25'	.63 mi. W. 78°15'	1.21 mi. E. 78°40'	.87 mi. W 78°35'	1.60 mi. W. 78°35'	.71 mi. W 78°35'	1.92 mi. W 78°35'	1.40 mi W. 78°35'	1.46 mi. E. 78°40'	.29 mi. W 78°40'
DATE COMPLETEO		11-14-58	3-27-58	3-3-58	7-26-58	5-29-58	7-10-58	11-1-58	12-19-58	4-8-58	4-17-58
ELEVATION		1107	1503	1710	1365	1648	1818	1725	1821	1716	1665
TULLY		6420 -	6059 - 6156	6710 -	6502 -	6862 -	6745 -	6595 -	6652 -	6550 -	6400 -
ONONDAOA		6934 - Chert, 6963 -	6673 - 6694	7309 - Chert, 7321 -	7109 - Chert, 7123 -	7477 - Chert, 7486 -	7369 - Chert, 7382 -	7473 - Chert, 7482 -	7384 - Chert, 7400 -	7190 - Chert, 7207 -	7032 - Chert, 7046 -
ORISKANY		7102 - 7118	6694 - 6726 Small show gas salt water	7376 - 7400	7169 - S.W. at 7173	7528 - 7550 S.W. at 7534	7429 - 7447	7706 - 7730	7528 - S.W at 7540	7264 - 7278 Show of gas	7106 - 7123
HELDERBERG											
SALINA											
LOCKPORT											
ALBION	RED MEDINA (GRIMSBY)										
	WHITE MEDINA (WHIRLPODL)										
QUEENSTON											
TOTAL DEPTH		7166	6736	7405	7240	7590	7448	7760	7548	7280	7124
DEEPEST FORMATION REACHED		Helderberg	Helderberg	Helderberg	Helderberg	Helderberg	Helderberg	Helderberg	Oriskany	Helderberg	Helderberg
RESULT		1,640 Mcf gas from chert 1,837 Mcf gas from Oriskany after frac Discovery Well	35 Mcf gas 1 bbl salt water in lower part of Oriskany Abandoned	1,850 Mcf gas after frac R.P. 1125 psi 72 hrs.	Salt water in Oriskany Abandoned	Hole filled up 2000 feet with salt water Abandoned	3,000 Mcf gas after frac R.P 1925 psi. 26 hrs.	No gas after frac Abandoned	Salt water in Oriskany Abandoned	106 Mcf gas after frac R.P 1025 psi 36 hrs.	3,150 Mcf gas after frac R.P 2320 psi 24 hrs.

TABLE 1
SHEET 2

SUMMARIZED RECORDS OF DEEP WELLS (continued)

COUNTY	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield
MAP NUMBER	11	12	13	14	15	16	17	18	19	20
NAME OF WELL	Telford Bogle 1	Broker	Jos Brundridge 1	City of Dubois 4	F J Cochran 1	Art Dufour 1	Helen D S Gordon 4	Helen D S Gordon 5	Helen D S Gordon 6	Helen D S Gordon 7
OPERATOR	Fairman Drilling Co	I. Hague	Godfrey L Cabot Inc.	New York State Nat. Gas Corp	New York State Nat Gas Corp	New York State Nat Gas Corp	New York State Nat. Gas Corp	New York State Nat Gas Corp	New York State Nat. Gas Corp.	New York State Nat. Gas Corp
TOWNSHIP	Union	Union	Huston	Union	Brady	Brady	Huston	Huston	Huston	Huston
QUADRANGLE	Penfield 115	Penfield 58	Penfield 137	Penfield 116	Penfield 146	Penfield 133	Penfield 119	Penfield 127	Penfield 142	Penfield 155
LATITUDE	1.11 mi. N. 41°05'	1.80 mi N 41°05'	.32 mi. S. 41°10'	2.58 mi N 41°05'	.17 mi. S. 41°05'	.43 mi S 41°05'	.33 mi N. 41°10'	.44 mi. N. 41°10'	.15 mi S. 41°10'	.77 mi. N. 41°10'
LONGITUDE	.38 mi E. 78°40'	1.51 mi W 78°35'	1.98 mi E. 78°35'	1.75 mi E. 78°40'	.93 mi E. 78°45'	1.55 mi E 78°45'	1.41 mi E. 78°35'	.83 mi E. 78°35'	.35 mi E 78°35'	1.44 mi E 78°35'
DATE COMPLETED	2 - 2 - 58	5 - 16 - 58	4 - 14 - 58	2 - 4 - 58	10 - 18 - 58	8 - 29 - 58	3 - 7 - 58	4 - 21 - 58	6 - 19 - 58	11 - 5 - 58
ELEVATION	1677	1941	1838	1759	1669	1495	1793	1526	1783	1786
TULLY	6480 -	6484 -	6420 - 6531	6725 -	6820 -	6479 -	6589 -	6475 -	6767 -	6622 -
ONONDAGA	7136 - Chert, 7150 -	7145 - Chert, 7159 -	7094 - Chert, 7104 -	7359 - Chert, 7376 -	7426 - Chert, 7441 -	7190 - Chert, 7210 -	7229 - Chert, 7245 -	7090 - 7106 Chert, 7106 - 7153	7452 - Chert, 7470 -	7252 - Chert, 7269 - 50 Mcf gas
ORISKANY	7205 - 7220	7221 - 7225	7152 - 7160 Show of gas	7435 - 7456	7495 - 7530 SW, 7501 - 7503	7267 - 7291	7289 - 7308 422 Mcf gas 7294 - 7296	7153 - 7174 298 Mcf gas 7155 - 7160	7518 - 7541 537 Mcf gas	7313 - 7334 243 Mcf gas
HELDERBERG										
SALINA										
LOCKPORT										
ALBION — RED MEDINA (GRIMSBY)										
ALBION — WHITE MEDINA (WHIRLPOOL)										
QUEENSTON										
TOTAL DEPTH	7223	7227	7161	7457	7530	7292	7309	7175	7543	7335
DEEPEST FORMATION REACHED	Helderberg	Helderberg	Helderberg	Helderberg	Oriskany	Helderberg	Helderberg	Helderberg	Helderberg	Helderberg
RESULT	1,600 Mcf gas after frac R P 2340 psi 2 days	Dry Abandoned	75 Mcf gas after frac Abandoned	1,712 Mcf gas after frac R P 1650 psi 4 days	Salt water in Oriskany Abandoned	Salt water after frac Abandoned	6,851 Mcf gas after frac R P 2260 psi 5 hrs.	3,755 Mcf gas after frac R P 2540 psi 27 hrs	2,877 Mcf gas after frac R P 2560 psi. 23 hrs	2,349 Mcf gas after frac R P 1630 psi 88 hrs

TABLE 1
SHEET 3

SUMMARIZED RECORDS OF DEEP WELLS (continued)

COUNTY	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield
MAP NUMBER	21	22	23	24	25	26	27	28	29	30
NAME OF WELL	Green Glen 1	Green Glen 1	Green Glen 2	John E. Hayes 2	Joel Horne et ux 1	Wm. Kardysuoska 1	Emery Miller 2	Emery Miller 3	New Shawmut Mining Co. 2	W & W Overturf 1
OPERATOR	Fairman Drilling Co.	Fairman Drlg. Co and NYS Nat Gas Corp	Manufacturers Light & Heat Co	New York State Nat. Gas Corp	New York State Nat. Gas Corp.	New York State Nat Gas Corp	Devonian Gas & Oil Co.	Devonian Gas & Oil Co.	Devonian Gas & Oil Co.	H. S. McKay et al
TOWNSHIP	Brady	Union	Huston	Brady	Brady	Brady	Union	Union	Huston	Huston
QUADRANGLE	Penfield 150	Penfield 121	Penfield 134	Penfield 132	Penfield 147	Penfield 140	Penfield 111	Penfield 131	Penfield 159	Penfield 160
LATITUDE	.25 mi. N. 41° 05'	2.60 mi. N. 41° 05'	.85 mi. N. 41° 10'	.02 mi. S. 41° 05'	.40 mi. S 41° 05'	2.65 mi. S. 41° 05'	2.76 mi. N. 41° 05'	2.62 mi. N 41° 05'	1.52 mi. N. 41° 10'	1.63 mi. S. 41° 15'
LONGITUDE	1.58 mi. W 78° 40'	2.20 mi. E 78° 40'	.65 mi. W 78° 35'	2.10 mi. W. 78° 40'	1.40 mi. E. 78° 45'	.24 mi. E. 78° 45'	.52 mi. E. 78° 40'	.32 mi. E 78° 40'	1.82 mi. E. 78° 35'	.98 mi. W. 78° 35'
DATE COMPLETED	9 - 25 - 58	3 - 17 - 58	5 - 29 - 58	5 - 21 - 58	8 - 14 - 58	6 - 9 - 58	1 - 15 - 58	5 - 14 - 58	12 - 17 - 58	12 - 19 - 58
ELEVATION	1508	1865	1625	1487	1474	1563	1768	1735	1698	1362
TULLY	6414 -	6677 -	6638 - 6725	6385 -	6516 -	6467 -	6653 -	6624 -	6530 -	6425 -
ONONDAGA	7014 - Chert, 7026 - 46 Mcf gas	7323 - Chert, 7337 - 500 Mcf gas	7236 - Chert, 7248 -	7006 - Chert, 7023 -	7125 - Chert, 7139	7099 - Chert, 7114 -	7249 - Chert, 7264 -	7210 - Chert, 7224 -	7152 - Chert, 7170 -	7003 - Chert, 7019 -
ORISKANY	7085 -	7392 - 7407	7370 - SW at 7391	7095 - 7122	7175 -	7170 - 7190 311 Mcf gas at 7173	7327 - 7348	7286 - 7302	7215 - 7235	7073 -
HELDERBERG										
SALINA										
LOCKPORT										
ALBION — RED MEDINA (GRIMSBY)										
ALBION — WHITE MEDINA (WHIRLPOOL)										
QUEENSTON										
TOTAL DEPTH	7109	7408	7396	7123	7183	7191	7349	7303	7237	7098
DEEPEST FORMATION REACHED	Oriskany	Helderberg	Helderberg	Helderberg	Oriskany	Helderberg	Helderberg	Helderberg	Helderberg	Oriskany
RESULT	2,214 Mcf gas after frac R.P. 2410 psi.	1,600 Mcf gas after frac R.P. 2140 psi 41 hrs.	Salt water in Oriskany Abandoned	1,992 Mcf gas after frac R.P. 3140 psi 24 hrs.	4,055 Mcf gas after frac R.P. 2760 psi 8 days	1,300 Mcf gas after frac R.P. 2560 psi 40 hrs.	20,000 Mcf gas after frac R.P. 2440 psi. 65 hrs.	18,500 Mcf gas after frac R.P. 2150 psi 25 hrs	12,105 Mcf gas after frac. R.P. 2450 psi 22 hrs.	5,600 Mcf gas after frac R.P. 3815 psi 4 days

TABLE 1
SHEET 4

SUMMARIZED RECORDS OF DEEP WELLS (continued)

COUNTY	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield
MAP NUMBER	31	32	33	34	35	36	37	38	39	40
NAME OF WELL	A.J. Palumbo 1	A.J. Palumbo 3	Pa. Tract 49 1	Pa. Tract 49 2	Pa. Tract 49 3	Pa. Tract 49 4	Pa. Tract 65 1	Pa. Tract 66 1	Pa. Tract 66 2	Pa. Tract 66 3
OPERATOR	New York State Nat. Gas Corp.	New York State Nat. Gas Corp	New York State Nat. Gas Corp	New York State Nat. Gas Corp	New York State Nat. Gas Corp	New York State Nat. Gas Corp.	New York State Nat. Gas Corp.	New York State Nat. Gas Corp	New York State Nat. Gas Corp	New York State Nat. Gas Corp
TOWNSHIP	Huston	Huston	Huston	Huston	Huston	Huston	Huston	Huston	Huston	Huston
QUADRANGLE	Penfield 153	Penfield 158	Penfield 109	Penfield 122	Penfield 129	Penfield 138	Penfield 148	Penfield 149	Penfield 154	Penfield 157
LATITUDE	2.00 mi. S 41°15'	2.60 mi. S. 41°15'	.36 mi. N 41°10'	.70 mi. N 41°10'	.66 mi. N 41°10'	.02 mi. N. 41°10'	2.02 mi. S 41°15'	1.40 mi. S 41°15'	1.78 mi. S 41°15'	1.19 mi. S 41°15'
LONGITUDE	1.69 mi. W. 78°35'	2.03 mi. W. 78°35'	2.08 mi. W 78°30'	2.14 mi. E. 78°35'	1.70 mi. W. 78°30'	2.08 mi. W 78°30'	1.43 mi. W 78°35	1.20 mi. W. 78°35'	1.17 mi. W 78°35'	.72 mi. W 78°35'
DATE COMPLETED	10 - 21 - 58	12 - 6 - 58	1 - 15 - 58	3 - 17 - 58	4 - 21 - 58	5 - 26 - 58	8 - 19 - 58	8 - 25 - 58	11 - 5 - 58	11 - 26 - 58
ELEVATION	1628	1372	1835	1735	1815	1742	1581	1389	1377	1619
TULLY	6643 -	6475 -	6485 - 6595	6435 -	6451 -	6344 -	6640 -	6353 -	6430 -	6607 -
ONONDAGA	7227 - Chert, 7249 -	7072 - Chert, 7087 -	7138 - 7151 Chert, 7151 -	7089 - Chert, 7108 -	7115 - Chert, 7130 -	7004 - Chert, 7019 -	7236 - Chert, 7256 -	6939 - Chert, 6959 -	7032 - Chert, 7050 -	7196 - Chert, 7213 -
ORISKANY	7300 - 7329	7133 - 7162 Gas, 7135 - 7145	7197 - 7211 880 Mcf gas at 7203	7152 - 7166	7165 - 7176 858 Mcf gas 7167 - 7171	7065 - 7074 1039 Mcf gas 7065 - 7067	7310 -	7011 - 7035 14 Mcf gas	7105 - 7132	7263 - 7293 Gas, 7265 - 7267
HELDERBERG										
SALINA										
LOCKPORT										
ALBION — RED MEDINA (GRIMSBY)										
ALBION — WHITE MEDINA (WHIRLPOOL)										
QUEENSTON										
TOTAL DEPTH	7330	7164	7212	7168	7178	7075	7320	7036	7133	7294
DEEPEST FORMATION REACHED	Helderberg	Helderberg	Helderberg	Helderberg	Helderberg	Helderberg	Oriskany	Helderberg	Helderberg	Helderberg
RESULT	2,877 Mcf gas after frac R P 1922 psi. 64 hrs.	5,305 Mcf gas after frac R.P 3815 psi. 46 hrs	12,063 Mcf gas after frac R P 3200 psi. 10 days	830 Mcf gas after frac R P 2646 psi 12 days	858 Mcf gas after frac R.P 3125 psi 18 hrs.	1,378 Mcf gas after frac R P 1535 psi 6 days	6,501 Mcf gas after frac R P 3703 psi. 112 hrs. Discovery Well	311 Mcf gas after frac R.P 2071 psi 39 hrs	1,174 Mcf gas after frac RP 3770 psi 128 hrs	1,608 Mcf gas after frac R P 3282 psi 24 hrs

TABLE I
SHEET 5

SUMMARIZED RECORDS OF DEEP WELLS (continued)

COUNTY	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield
MAP NUMBER	41	42	43	44	45	46	47	48	49	50
NAME OF WELL	Pa Tract 76 1	Pa Tract 76 2	Pa Tract 76 3	Pa Tract 76 4	Pa. Tract 77 1	Pentz Estate 1	C.W. Rafferty 1	W.M. Reiler 2	C.G Schwem 2	H.T.Shoffer 1
OPERATOR	Manufacturers Light & Heat Co.	Manufacturers Light & Heat Co.	Manufacturers Light & Heat Co	Manufacturers Light & Heat Co	New York State Nat. Gas Corp	John Fox et al	New York State Nat. Gas Corp.	Godfrey L. Cabot, Inc	New York State Nat. Gas Corp	Sam Jack et al
TOWNSHIP	Huston	Huston	Huston	Huston	Huston	Union	Brady	Huston	Union	Union
QUADRANGLE	Penfield 118	Penfield 123	Penfield 130	Penfield 139	Penfield 143	Penfield 141	Penfield 151	Penfield 128	Penfield 125	Penfield 145
LATITUDE	.89 mi. N. 41° 10'	.87 mi. N. 41° 10'	.81 mi. N. 41° 10'	1.76 mi. N. 41° 10'	.36 mi. S. 41° 10'	2.92 mi. N. 41° 05'	2.00 mi. S. 41° 05'	.68 mi. N. 41° 10'	2.32 mi. S 41° 10'	.63 mi. N. 41° 05'
LONGITUDE	1.66 mi. E. 78° 35'	1.99 mi. W. 78° 30'	1.48 mi. W. 78° 30'	2.06 mi. W. 78° 30'	1.94 mi. W. 78° 30'	.36 mi. E. 78° 40'	.36 mi. E. 78° 45'	1.58 mi. W. 78° 30'	1.46 mi. E. 78° 40'	.13 mi. W. 78° 40'
DATE COMPLETED	2 - 26 - 58	4 - 8 - 58	5 - 6 - 58	6 - 4 - 58	8 - 27 - 58	6 - 24 - 58	9 - 24 - 58	3 - 14 - 58	4 - 1 - 58	7 - 17 - 58
ELEVATION	1844	1709	1763	1490	1828	1640	1590	1803	1835	1682
TULLY	6612 - 6745	6403 - 6508	6395 - 6511	6260 - 6371	6372 -	6585 -	6564 -	6430 - 6545	6737 -	6410 -
ONONDAGA	7255 - Chert, 7279 -	7033 - Chert, 7056 -	7054 - Chert, 7068 -	6892 - Chert, 6908 -	7036 - Chert, 7052 -	7178 - Chert, 7193 -	7193 - Chert, 7207 - Gas	7086 - Chert, 7094 - 75 Mcf gas	7322 - Chert, 7340 -	7066 - Chert, 7075 -
ORISKANY	7320 - 7335 Gas at 7326	7099 - 7116 Gas at 7104	7108 - 7123 Gas at 7120	6948 - 6972 Gas at 6955	7096 - 7102	7275 - 7291	7260 - 7283 Gas	7137 - 7148	7400 - 7425	7131 - 7152
HELDERBERG										
SALINA										
LOCKPORT										
ALBION — RED MEDINA (GRIMSBY)										
ALBION — WHITE MEDINA (WHIRLPOOL)										
QUEENSTON										
TOTAL DEPTH	7337	7118	7125	6973	7103	7308	7284	7149	7426	7154
DEEPEST FORMATION REACHED	Helderberg	Helderberg	Helderberg	Helderberg	Helderberg	Helderberg	Helderberg	Helderberg	Helderberg	Helderberg
RESULT	4,700 Mcf gas after frac R.P. 2945 psi 20 hrs.	7,038 Mcf gas after frac R.P. 2510 psi 48 hrs.	3,221 Mcf gas after frac R.P. 2233 psi 144 hrs.	12,800 Mcf gas after frac R.P. 3700 psi 72 hrs.	48 Mcf gas after frac R.P. 3070 psi 63 days Abandoned	3,216 Mcf gas after frac R.P. 1460 psi 14 hrs.	504 Mcf gas after frac R.P. 1685 psi 65 hrs.	3,100 Mcf gas after frac R.P. 3200 psi 60 hrs	1,802 Mcf gas after frac R.P. 710 psi 32 hrs.	1,700 Mcf gas after frac R.P. 1740 psi 26 hrs.

TABLE 1
SHEET 6

SUMMARIZED RECORDS OF DEEP WELLS (continued)

COUNTY	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Clearfield	Crawford	Crawford
MAP NUMBER	51	52	53	54	55	56	57	58	59	60
NAME OF WELL	H.T. & L.H. Shoffer 1	Sure Shot Land & Gun Club 4	Underhill 3	Pa Tract 32 7	Pa Tract 36 5	Pa Tract 36 6	Pa. Tract 40 3	Underhill 1	Davis 1	Lewis Farro, Jr 1
OPERATOR	T.W. Phillips Gas & Oil Co.	The Sylvania Corp	Devonian Gas & Oil Co	New York State Nat. Gas Corp	Parsons Bros	Parsons Bros.	Manufacturers Light & Heat Co.	Devonian Gas & Oil Co.	Howard Vinapol et al	Felmont Oil Corp.
TOWNSHIP	Union	Union	Huston	Goshen	Goshen	Goshen	Goshen	Huston	Beaver	Beaver
QUADRANGLE	Penfield 114	Penfield 117	Penfield 156	Clearfield 38	Clearfield 39	Clearfield 37	Clearfield 41	Clearfield 40	Girard 23	Girard 25
LATITUDE	1.21 mi. N 41°05'	2.82 mi. N. 41°05'	1.86 mi. S. 41°15'	1.80 mi. S. 41°15'	1.36 mi S 41°15'	1.16 mi S 41°15'	1.72 mi. S. 41°15'	1.99 mi S 41°15'	85 mi S. 41°50'	.73 mi. N 41°45'
LONGITUDE	.11 mi. E. 78°40'	2.34 mi. E. 78°40'	.78 mi W. 78°30'	2.18 mi. E. 78°25'	.80 mi W 78°20'	1.59 mi W 78°20'	.08 mi. E. 78°25'	.35 mi. E. 78°30'	1.59 mi E. 80°30'	.47 mi W 80°30'
DATE COMPLETED	1 - 27 - 58	2 - 19 - 58	11 - 28 - 58	2 - 14 - 58	2 - 7 - 58	1 - 22 - 58	6 - 27 - 58	5 - 23 - 58	1 - 23 - 58	1 - 14 - 58
ELEVATION	1720	1866	1890	1733	2103	1973	2028	1700	995	1148
TULLY	6510 - 6610	6692 - 6785	6553-	6165-	6445 - 6560	6380 -	6295 - 6416	6187-	1950 - 1962	
ONONDAGA	7135 - Chert, 7151-	7380 - Chert, 7392 -	7183 - Chert, 7206-	6900 - Chert, 6920	7200 - 7223 Chert, 7223 -	7080 - Chert, 7096-	6980 - Chert, 7001-	6870 - Chert, 6880 -	2100 - Show of oil	2318 - Chert, 2450-
ORISKANY	7205 - 7224 Gas at 7208	7568 -	7248 - 7279	6946 - 6951	7254 - 7261	7129 - 7138	7034 - 7036	6928 - 6950 52 Mcf gas	2374 - Show of oil	Horizon 2555 -
HELDERBERG										
SALINA										Salt, 2810 - 2839 2950 - 2957
LOCKPORT										3210 - 3480 Black water at 3373
ALBION — RED MEDINA (GRIMSBY)										3604 - 3695 Gas at 3657 SW of 3682
ALBION — WHITE MEDINA (WHIRLPOOL)										3790 - 3792
QUEENSTON										3792 -
TOTAL DEPTH	7263	7580	7280	6955	7267	7146	7042	6973	2377	3886
DEEPEST FORMATION REACHED	Helderberg	Oriskany	Helderberg	Helderberg	Helderberg	Helderberg	Helderberg	Helderberg	Oriskany	Queenston
RESULT	1,418 Mcf gas after frac R.P. 500 psi 1 hour	Salt water, 20 gals in 1 hr. at 7579 Abandoned	7,107 Mcf gas after frac R.P. 3850 psi 12 hrs	928 Mcf gas after frac R.P. 2100 psi 10 days	150 Mcf gas after frac Abandoned	3,000 Mcf gas after frac R.P. 1050 psi 14 hrs	Dry Abandoned	926 Mcf gas after frac RP 2650 psi 95 hrs	Show of oil in Onondaga and Oriskany Abandoned	300 Mcf gas 27 bbls oil R.P. 990 psi 67 hrs Production from Red Medina

TABLE I
SHEET 7

SUMMARIZED RECORDS OF DEEP WELLS (continued)

COUNTY	Crawford	Crawford	Crawford	Crawford	Elk	Elk	Erie	Erie	Erie	Erie
MAP NUMBER	61	62	63	64	65	66	67	68	69	70
NAME OF WELL	Henry Rippert 1	Shode Land 1	Harry J. Wigond 1	Jos Kordosh 1	New Shawmut Mining Co	Gladys Summers 1	Pa Offshore Block 1, No 1	C. Innes 1	J Wolf 1	M K Bonney 1
OPERATOR	Felmont Oil Corp	Imperial (Pgh)	Felmont Oil Corp	M. L Benedum and Ark.-La. Co.	New York State Nat Gas Corp	J C Walker	New York State Nat Gas Corp	Vern Stephens et al	Vern Stephens et al	Olson et al
TOWNSHIP	Spring	Spring	Beaver	Summerhill	Joy	Benezette	in Lake Erie	Summit	Green	Venango
QUADRANGLE	Girard 24	Girard 27	Girard 26	Linesville 14	Benezette 270	Benezette 271	Fairview 3	Erie 103	Erie 108	North East 18
LATITUDE	.49 mi N 41°50'	1.04 mi S 41°50'	1.20 mi. N 41°45'	2.38 mi. S. 41°45'	1.51 mi S. 41°20'	.95 mi. S 41°25'	.97 mi. N. 42°00'	2.52 mi. N. 42°00'	.98 mi S 42°05'	2.40 mi. N. 42°00'
LONGITUDE	1.90 mi. W 80°20'	1.75 mi E. 80°25'	.85 mi. W. 80°30'	1.37 mi. E. 80°20'	.31 mi. E. 78°30'	1.00 mi. W 78°15'	1.35 mi. W 80°25'	1.25 mi E 80°05'	.48 mi. W 80°00'	1.47 mi E. 79°55'
DATE COMPLETED	2 - 14 - 58	9 - 19 - 58	8 - 21 - 58	8 - 26 - 58	12 - 12 - 58	12 - 15 - 58	10 - 24 - 58	5 - 31 - 58	12 - 31 - 58	9 - 23 - 58
ELEVATION	1103	932	1131	1326	1645	1524	602	1356	1343	1492
TULLY	2071 - 2118				6145 -	6095 -	1100 -	2008 - 2150	2004 - 2117	2289 -
ONONDAGA	2259 - Chert, 2409	2100 -	2286 -		6740 - Chert, 6757 -	6700 -	1273 -	2233 -	2237 -	2509 -
ORISKANY	2507 - 2519 Salt water at 2508 300 ft in 8 hrs	2383 - 2393	2503 - 2513 Gas at 2508		Horizon 6795 -	6737 - 30 gals SW/hr.	1562 - 1581	2479 - 2492 S W at 2482	2491 - S W at 2508	2752 - 2758
HELDERBERG	2519 -									
SALINA	Salt 2901 - 3013 -									Salt 2810 -
LOCKPORT	3130 - 3400 Black water at 3236	3002 - 3270 SG at 3155 SW at 3180	3185 - 3450 Black water at 3340							
ALBION — RED MEDINA (GRIMSBY)	3485 - Gas at 3528 Oil at 3570	3367 -	3575 - SG at 3624 SO, 3600 - 3624				2490 - Gas, 2508 - 2511			
ALBION — WHITE MEDINA (WHIRLPOOL)	3654 - 3655									
QUEENSTON	3655 -	3555 -	3760 -							
TOTAL DEPTH	3697	3562	3853	8030	7050	6746	5098	2517	2536	2849
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Pre Cambrian	Salina	Oriskany	Upper Cambrian	Helderberg	Helderberg	Salina
RESULT	62 Mcf gas 1 bbl oil 2 bbls. S.W. after frac R.P. 550 psi 15 hrs. Abandoned	75 Mcf gas 1 bbl. oil 10 bbls S.W after frac R.P. 810 psi 48 hrs Shut in	125 Mcf gas 2 bbls oil show salt water R.P. 1050 psi 40 hrs Shut in	No information released Abandoned	Show of gas after frac Abandoned	Salt water in Oriskany Abandoned	200 Mcf gas after frac. R. P. 510 psi 24 hrs Shut in	Salt water in Oriskany Abandoned	Salt water in Oriskany Abandoned	Show of oil 2798 - 2813 Abandoned

TABLE I
SHEET 8

SUMMARIZED RECORDS OF DEEP WELLS (continued)

COUNTY		Erie	Erie	Erie	Erie	Indiana	Indiana	Indiana	Indiana	Indiana	Indiana
MAP NUMBER		71	72	73	74	75	76	77	78	79	80
NAME OF WELL		Jos Henderson 1	Po State Game Lands, No. 1	F Pierce 1	Edna Roberts 1	James Neal 1	Emil K. Abel 1	Harry L George 2	N. Lessick 1	John F Peterman 1	Woodrow Plymire 1
OPERATOR		Penna Gas Co No. 1545	Benedum Trees Co.	Great Lakes Nat. Gas Co	Britton, Miller DeArment & Walker	Fryer and Hanson	New York State Nat Gas Corp	New York State Nat Gas Corp	Fairman Drilling Co	T.W. Phillips Gas & Oil Co.	Fairman Drilling Co.
TOWNSHIP		Venango	Greenfield	Springfield	Conneaut	Banks	Armstrong	Armstrong	Young	Armstrong	Armstrong
QUADRANGLE		Northeast 19	Northeast 20	Girard 29	Girard 28	Punxsutawney 31	Elders Ridge 34	Elders Ridge 32	Elders Ridge 31	Elders Ridge 36	Elders Ridge 33
LATITUDE		.02 mi. N 42°05'	2.33 mi S 42°10'	1.30 mi. S. 42°00'	.14 mi. S. 41°55'	1.47 mi. S 40°55'	1.27 mi. N 40°35'	.45 mi. N 40°35'	2.25 mi. S 40°35'	1.16 mi. N 40°35'	1.48 mi N 40°35'
LONGITUDE		1.57 mi. W 79°50'	.38 mi. W. 79°50'	.97 mi. W 80°25	1.73 mi. W 80°25'	1.93 mi W 78°50'	.47 mi. W. 79°15'	1.36 mi. W. 79°15'	1.40 mi. E 79°20'	.57 mi W 79°15'	1.76 mi. W. 79°15'
DATE COMPLETED		6 - 11 - 58	8 - 21 - 58	12 - 31 - 58	11 - 1 - 58	3 - 18 - 58	10 - 1 - 58	6 - 11 - 58	5 - 23 - 58	12 - 6 - 58	8 - 27 - 58
ELEVATION		1391	1456	687	883	1905	1406	1509	1334	1403	1389
TULLY		2160 - 2245	2236 - 2246	1252 - 1287		6765 -	7025 -	7098 -	7023 -	7097 - 7207	7136 -
ONONDAGA		2387 - 2639	2350 -	1433 - SG at 1587 & 1615	1803 - 2087	7555 - Chert, 7567 - SW at 7590	7593 - 7605 Chert, 7605 -	7674 - Chert, 7689 -	7612 - Chert, 7625 -	7659 - Chert, 7691 -	7687 - Chert, 7701 -
ORISKANY		No sand	2589 - 2596	1710 - 1750 SG, SW at 1710	2087 - 2101 SW at 2087		7731 - 7745	7821 - 7852 284 Mcf gas	7770 - 7788		
HELDERBERG		2639 - SW at 2262 - 2269	2596 -								
SALINA				Salt 2170 - 2227 2248 - 2255	2170 - 2700 Salt, 2354 - 2370 2551 - 2630						
LOCKPORT		3120 - 3370 Black water at 3245	3050 - 3316 Black water at 3204	2280 - Black water at 2475	2700 - 2968 1 boiler SW per hr at 2877						
ALBION	RED MEDINA (GRIMSBY)	3457 - SG at 3524	3450 - 3495 Gas at 3480	2640 - 60 Mcf gas	3055 - 3167 Gas at 3090						
	WHITE MEDINA (WHIRLPOOL)	3598 - 3608 Show of gas	3562 - 3578								
QUEENSTON		3608 -	3578 -	2843 -	3254 -						
TOTAL DEPTH		3623	3582	2850	3265	7590	7747	7860	7800	7787	7877
DEEPEST FORMATION REACHED		Queenston	Queenston	Queenston	Queenston	Onondaga	Helderberg	Helderberg	Helderberg	Onondaga	Helderberg
RESULT		Salt water in Oriskany Show of gas in Albion Abandoned	Salt water in Lockport Show of gas in Grimsby Abandoned	780 Mcf gas after frac R.P 855 psi 67 hrs Shut in	2,200 Mcf gas after frac RP 930 psi, 68 hrs. Plugged back to 3150 ; Shut in Discovery Well	Salt water in Onondago chert Abandoned	5,305 Mcf gas after frac R.P. 3440 psi 96 hrs	3,100 Mcf gas after frac R.P. 2350 psi 24 hrs	165 Mcf gas and salt water Abandoned	1,500 Mcf gas after frac R.P 1340 psi 2 hrs.	1,309 Mcf gas after frac R.P 3525 psi 11 days

TABLE I
SHEET 9

SUMMARIZED RECORDS OF DEEP WELLS (continued)

COUNTY	Indiana	Indiana	Indiana	Indiana	Indiana	Indiana	Indiana	Indiana	Indiana	Indiana
MAP NUMBER	81	82	83	84	85	86	87	88	89	90
NAME OF WELL	Orville M Watson 1	J.T. Jackson 4	J.T. Jackson 6	Beulah Stiles et al, No 2	E.A. Young 1	James S Blair 1	C.A Ferrier 1	Herman George 1	M D McCreery 1	Marg Overdorff 2
OPERATOR	T.W. Phillips Gas & Oil Co	T.W. Phillips Gas & Oil Co	T.W. Phillips Gas & Oil Co	New York State Nat Gas Corp	Felmont Oil Corp	Felmont Oil Corp.	Felmont Oil Corp.	Felmont Oil Corp.	M D McCreery	T.W. Phillips Gas & Oil Co
TOWNSHIP	Armstrong	Brush Valley	Brush Valley	Buffington	Buffington	Buffington	Buffington	Buffington	Buffington	Buffington
QUADRANGLE	Elders Ridge 30	Indiana 6	Indiana 8	Indiana 7	Indiana 5	Barnesboro 9	Barnesboro 10	Barnesboro 7	Barnesboro 13	Barnesboro 8
LATITUDE	.59 mi N 40°35'	.94 mi. N 40°30'	.28 mi N. 40°30'	.14 mi N 40°30'	.62 mi. N. 40°30'	1.23 mi N 40°30'	2.31 mi N 40°30'	1.94 mi. N. 40°30'	2.63 mi. S 40°35'	1.48 mi N 40°30'
LONGITUDE	.74 mi. W 79°15'	.57 mi. W 79°00'	.55 mi. W 79°00'	.09 mi. W 79°00'	.30 mi. W. 79°00'	.01 mi. E. 79°00'	1.07 mi E 79°00'	.70 mi. E 79°00'	1.61 mi. E. 79°00'	.68 mi E 79°00'
DATE COMPLETED	2 - 14 - 58	8 - 31 - 58	11 - 29 - 58	11 - 6 - 58	8 - 22 - 58	5 - 12 - 58	5 - 17 - 58	1 - 15 - 58	12 - 3 - 58	4 - 25 - 58
ELEVATION	1408	1864	1786	1956	1961	1792	1858	1990	1916	1983
TULLY	7089 - 7235	7467 -	7275 - 7385	7290 -	7430 -	7360 - 7450	7543 - 7555	7515 - 7540	7619 -	7635 - 7758
ONONDAGA		8228 - Chert, 8243 -		8024 - Chert, 8040 -	8167 - Chert, 8183 -	8111 - 8120 Chert, 8120-21	8246 - 8253 Chert, 8253 -	8259 - Chert, 8275 -	8402 - Chert, 8419 -	8271 - 8282 Chert, 8289 - 700 Mcf gas at 8304
ORISKANY		8349 - 8369		8138 - 8158	8288 - 8315 Very small show gas	8233 -	8356 -	8393 - 8412	8528 - Salt water	8394 -
NELOERBERG										
SALINA										
LOCKPORT										
ALBION — RED MEDINA (GRIMSBY)										
ALBION — WHITE MEDINA (WHIRLPOOL)										
QUEENSTON										
TOTAL DEPTH	7820	8376	8281	8160	8315	8260	8385	8432	8542	8410
DEEPEST FORMATION REACHED	Hamilton	Helderberg	Hamilton	Helderberg	Oriskany	Oriskany	Oriskany	Helderberg	Oriskany	Oriskany
RESULT	Show gas at 1172 To complete as shallow well Shale, 7235 - 7820	2,700 Mcf gas after frac R.P. 3470 psi 32 days No gas before frac	Shale, 7385 - 8281 Dry Abandoned	2,698 Mcf gas after frac R.P. 3560 psi 66 hrs.	4,500 Mcf gas after frac R.P. 3275 psi 18 hrs.	8,000 Mcf gas after frac R.P. 4169 psi 9 days	16,000 Mcf gas after frac R.P. 4040 psi 6½ days	3,250 Mcf gas after frac R.P. 4013 psi 70 hrs	200 Mcf gas from chert, after frac Abandoned	4,284 Mcf gas natural at 8336 R.P. 4250 psi 24 days

TABLE I
SHEET 10

SUMMARIZED RECORDS OF DEEP WELLS (continued)

COUNTY	Indiana	Indiana	Indiana	Indiana	Indiana	Indiana	Juniata	Luzerne	McKean	Pike
MAP NUMBER	91	92	93	94	95	96	97	98	99	100
NAME OF WELL	Beulah Stiles et al, No 1	Stutzman et al 1	J.T. Jackson 5	Stephens & Davis 1	Vinton Lond Co 1	Vinton Land Co 2	Wm. Rambler 1	Goodwin 1	Lot 4 1	Wolter Hess 1
OPERATOR	New York State Nat. Gas Corp	New York State Nat. Gas Corp.	T.W. Phillips Gas & Oil Co	T.W. Phillips Gas & Oil Co.	Lee Minter et al	Lee Minter et al	Dan Waggner	Farmers Gas & Oil Co.	Thornton et al	Transcontinental Production Co
TOWNSHIP	Buffington	Buffington	Brush Valley	Brush Valley	Buffington	Brush Valley	Tuscarora	Lehman	Hamilton	Shohola
QUADRANGLE	Barnesboro 11	Barnesboro 12	New Florence 9	New Florence 10	New Florence 8	New Florence 11	East Waterford 2	Harvey Lake 1	Kinzua 13	Milford 1
LATITUDE	.53 mi. N. 40°30'	2.25 mi. N. 40°30'	.06 mi. S 40°30'	.48 mi S 40°30'	.05 mi. S 40°30'	.97 mi S 40°30'	.72 mi. N 40°25'	1.75 mi. N 41°15'	.87 mi. N. 41°50'	2.20 mi. N 41°25'
LONGITUDE	.19 mi. E. 79°00'	1.32 mi E. 79°00'	.63 mi. W 79°00'	.74 mi W. 79°00'	.28 mi W 79°00'	1.67 mi W. 79°00'	.44 mi E. 77°35'	.18 mi. W 76°05'	2.18 mi W 78°50'	.37 mi W. 74°55'
DATE COMPLETED	7 - 11 - 58	10 - 3 - 58	10 - 23 - 58	11 - 15 - 58	8 - 18 - 58	12 - 29 - 58	10 - 3 - 58	10 - 31 - 58	9 - 19 - 58	3 - 9 - 58
ELEVATION	2047	1810	1925	1682	1874	1625	650	1236	2052	704
TULLY	7385 -	7485 -		7120 - 7225	7130 -	7245 -		4440 -		Hamilton 4050 -
ONONDAGA	8113 - Chert, 8130 -	8237 - Chert, 8250 -	8005 - Chert, 8015 - 2400 Mcf gas at 8051	7957 - Chert, 7977 - Gas at 8000	7865 - Chert, 7880 -	7959 - Chert, 7985 -			4716 - Show gas at 4729	6425 -
ORISKANY	8233 - 8254	8361 - 8377 Salt water			7996 - 8015		1307 - 1492		4780 - 4787 Salt water	7312 - 7320
HELDERBERG										
SALINA										
LOCKPORT										
ALBION — RED MEDINA (GRIMSBY)										
ALBION — WHITE MEDINA (WHIRLPOOL)										
QUEENSTON										
TOTAL DEPTH	8257	8378	8110	8062	8017	8045	5205	4730	4789	7563
DEEPEST FORMATION REACHED	Helderberg	Helderberg	Onondoga	Onondago	Helderberg	Onondaga	Lower Wills Creek	Hamilton	Helderberg	Helderberg
RESULT	2,456 Mcf gas after frac R.P. 3890 psi 22 hrs	25 gallons salt water in 18 hrs Abandoned	2,652 Mcf gas natural R.P. 1550 psi 1¼ hrs Not fraced Show gas at 1300	3,062 Mcf gas R.P. 3800 psi 4 days Not fraced Show gas at 1186	3,000 Mcf gas after frac R.P. 3905 psi 5 days	500 Mcf gas after frac R.P. 3860 psi 4 days	Water at 1700 Show gas at 3410 Sand, 4605 Abandoned	Dry Abandoned	Hole full of salt water Abandoned	Dry Abandoned

TABLE I
SHEET II

SUMMARIZED RECORDS OF DEEP WELLS (continued)

COUNTY	Potter	Potter	Potter	Potter	Somerset	Somerset	Somerset	Somerset	Somerset	Somerset
MAP NUMBER	101	102	103	104	105	106	107	108	109	110
NAME OF WELL	M. Easton 1	New York State Nat Gas Corp 1	C. Young 1	Pa Tract 72 1	Pa Tract 75 1	Royal Rhodes et al, No 1	C E Williams 1	C E Williams 2	C E Williams 3	Pa Tract 64 1
OPERATOR	United Nat Gas Co No 5603	United Nat Gas Co No 5604	United Nat Gas Co No 5602	New York State Nat Gas Corp	The Peoples Nat Gas Co	Felmont Oil Corp. and Peoples Nat Gas Co	The Peoples Nat. Gas Co	Eberly & Snee and Peoples Nat Gas Co	Peoples Nat. Gas Co. and Eberly & Snee	New York State Nat Gas Corp
TOWNSHIP	Genesee	Allegany	Bingham	Stewardson	Jefferson	Jenner	Jenner	Jenner	Jenner	Elklick
QUADRANGLE	Genesee 140	Genesee 138	Genesee 139	Galeton 29	Donegal 18	Somerset 7	Somerset 5	Somerset 6	Somerset 8	Meyersdale 1
LATITUDE	1.01 mi. N 41°55'	.57 mi S 41°55'	2.65 mi N. 41°55'	2.75 mi N 41°30'	2.75 mi N. 40°00'	2.76 mi N. 40°05'	1.97 mi S. 40°15'	2.59 mi S 40°15'	1.36 mi S 40°15'	1.48 mi N 39°45'
LONGITUDE	1.12 mi W 77°50'	.81 mi W 77°55'	1.55 mi W. 77°45'	2.16 mi E. 77°40'	.87 mi. W. 79°15'	2.01 mi. E. 79°05'	.05 mi. E. 79°05'	.36 mi W 79°05'	.60 mi E 79°05'	.15 mi. W 79°10'
DATE COMPLETED	10 - 6 - 58	7 - 8 - 58	8 - 27 - 58	2 - 7 - 58	6 - 21 - 58	11 - 11 - 58	2 - 14 - 58	7 - 31 - 58	12 - 5 - 58	12 - 12 - 58
ELEVATION	1892	2212	1982	1977	2461	2060	2572	2635	2356	2970
TULLY	4325 - 4377	4673 - 4730	4440 -	5908 - 5994		7383 -	Hamilton, 7250 -	Hamilton, 7205 -	Hamilton, 7235 -	7865 -
ONONDAGA	4947 -	5308 -	5074 -	6772 -		8236 - Chert, 8259 -	8024 - Chert, 8048 - 900 Mcf, 8078-8100	7955 - Chert, 7975 -	8080 Chert, 8100 -	8937 - Chert, 8966 -
ORISKANY	4974 -	5318 - Gas at 5318		6796 - 6837		8415 - 119 Mcf gas at 8420		8103 - 8210 Gas at 8108		9067 - 9192
HELDERBERG										
SALINA										
LOCKPORT										
ALBION — RED MEDINA (GRIMSBY)										
ALBION — WHITE MEDINA (WHIRLPOOL)										
QUEENSTON										
TOTAL DEPTH	4976	5321	5088	6857	7936	8450	8152	8260	8196	9198
DEEPEST FORMATION REACHED	Oriskany	Oriskany	Onondaga	Helderberg	Genesee	Oriskany	Onondaga	Helderberg	Onondaga	Helderberg
RESULT	325 Mcf gas natural R P 424 psi 68 hrs	443 Mcf gas natural R P 480 psi 24 hrs.	Operations suspended	696 Mcf gas after frac R.P. 1634 psi 5 days	Dry	3,100 Mcf gas after frac R.P. 3602 psi 116 hrs Discovery Well	16,025 Mcf gas after frac R.P. 3660 psi 72 hrs Discovery Well	9,521 Mcf gas after frac R.P. 3590 psi. 72 hrs.	1,639 Mcf gas after frac R.P. 3200 psi 24 hrs	Dry Abandoned

TABLE I
SHEET 12

SUMMARIZED RECORDS OF DEEP WELLS

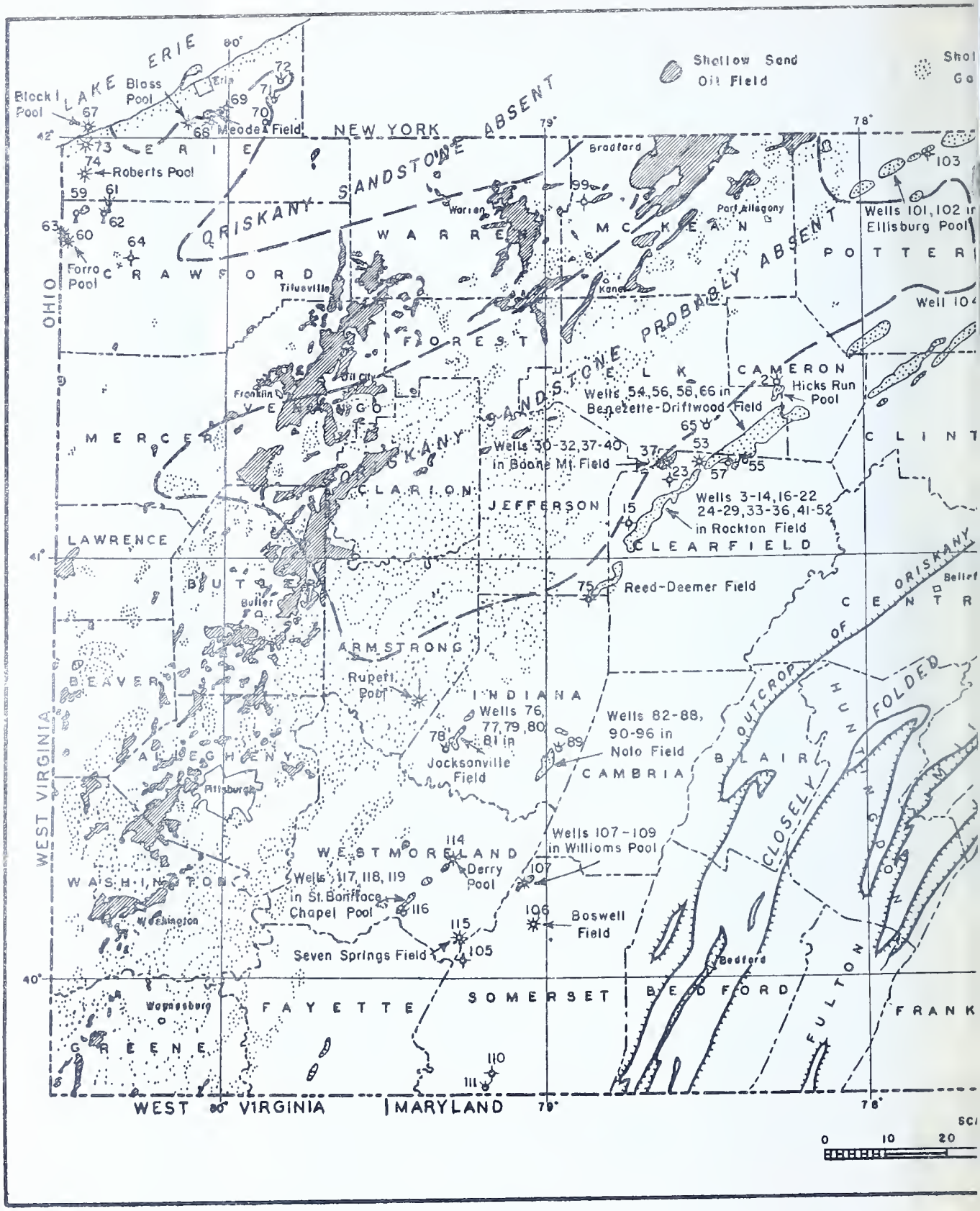
COUNTY		Somerset	Tioga	Wayne	Westmoreland	Westmoreland	Westmoreland	Westmoreland	Westmoreland	Westmoreland	
MAP NUMBER		111	112	113	114	115	116	117	118	119	
NAME OF WELL		Milton E Bender 1	Delton Allen 1	Clarence Price 1	Latrobe Construction Co 1	James S Blair 1	John A Cummings 1	John H Dent 1	Irah Keck 2	N A Myers 1	
OPERATOR		Manufacturers Light & Heat Co	Hanley & Bird	Transcontinental Producing Co	The Peoples Nat Gas Co	The Peoples Nat Gas Co	Felmont Oil Corp	The Peoples Nat Gas Co., # 4156	The Peoples Nat Gas Co # 4154	The Peoples Nat Gas Co # 4168	
TOWNSHIP		Elklick	Jackson	Damascus	Ligonier	Donegal	Mt Pleasant	Mt Pleasant	Mt Pleasant	Mt Pleasant	
QUADRANGLE		Grantsville 1	Troy 4	Damascus 1	Latrobe 9	Donegal 20	Donegal 21	Donegal 17	Donegal 16	Donegal 19	
LATITUDE		.99 mi. S 39°45'	.30 mi. S 42°00'	.93 mi. N. 41°40'	2.53 mi. N 40°15'	.88 mi. N 40°05'	.73 mi. S 40°10'	.09 mi. S 40°10'	.25 mi. N 41°10'	.45 mi. S 40°10'	
LONGITUDE		1.17 mi. W 79°10'	1.84 mi. E 77°00'	.45 mi. E 75°05'	2.18 mi. W 79°15'	1.27 mi. W 79°15'	1.13 mi. W 79°25'	.99 mi. W 79°25'	.64 mi. W 79°25'	1.24 mi. W 79°25'	
DATE COMPLETED		12 - 27 - 58	10 - 2 - 58	2 - 12 - 58	12 - 5 - 58	12 - 5 - 58	9 - 25 - 58	5 - 9 - 58	4 - 28 - 58	5 - 29 - 58	
ELEVATION		2797	1480	897	1905	2685	1905	1808	1887	1999	
TULLY		7465 - 7480	3172 - 3253	Hamilton, 4940 -	7055 -	Hamilton 6923 -	6903 - 7310	6806 -	6876 -	6982 - 7080	
ONONDAGA		8304 - 8333 Chert, 8333 - 8418	4255 - 4290	7480 -	7713 - Chert, 7731 - SG at 7767	7570 - Chert, 7606 - 3000 Mcf gas at 7685	7982 - 8005 Chert, 8005-8119 SG and SW	7404 - Chert, 7423 - 348 Mcf gas	7521 - Chert, 7545 -	7584 - Chert, 7603 -	
ORISKANY		8438 - 8550	4290 - 4320	No sand		7778 -			7702 - 7719		
HELDERBERG											
SALINA											
LOCKPORT											
ALBION	RED MEDINA (GRIMSBY)										
	WHITE MEDINA (WHIRLPOOL)										
QUEENSTON											
TOTAL DEPTH		8571	4330	8740	7805	7831	8119	7525	7722	7708	
DEEPEST FORMATION REACHED		Helderberg	Helderberg	Bossardville	Onondaga	Oriskany	Onondaga	Onondaga	Helderberg	Onondaga	
RESULT		1,500 Mcf gas from chert after frac Salt water in chert & Oriskany Abandoned	Dry Abandoned	Dry Abandoned	1,087 Mcf gas after frac RP 3250 psi. 10 days Discovery Well	3,663 Mcf gas natural RP 3250 psi 10 days Discovery Well	17 Mcf gas 8019 - 8030 1 bbl SW per hr 8050 - 8055 8058 - 8068 Abandoned	2,316 Mcf gas after frac RP 3075 psi. 48 hrs	583 Mcf gas after frac RP 2950 psi 10 days	1,404 Mcf gas after frac RP 3025 psi. 24 hrs	

TABLE I
SHEET 13

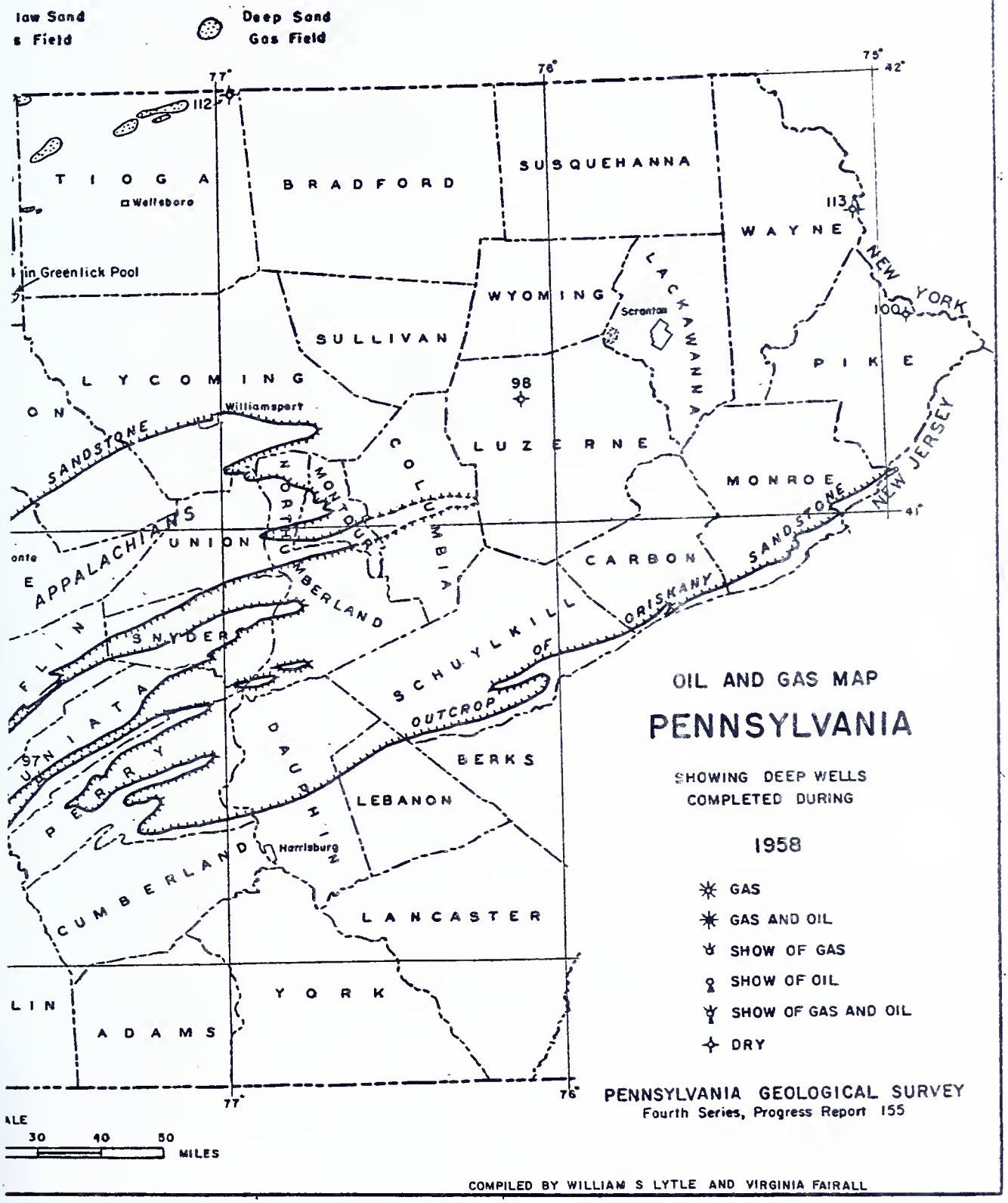
WELLS RE-ACTIVATED DURING 1958

COUNTY		Cameron	Clearfield	Clearfield	Elk	Erie	Erie				
MAP NUMBER											
NAME OF WELL		Pardee Estate 1	Calvin Bean 1	Raymond Bloom 1	Pa. State Game Lands, Wt 3653 1	C. A. Blass 1	Truesdail 1				
OPERATOR		Godfrey L. Cabot, Inc	TW Phillips Gas & Oil Co	New York State Nat. Gas Corp	Penna Gas Co	Chas. Siegel	Summit Development Co.				
TOWNSHIP		Gibson	Brady	Union	Highland	Mc Kean	Venango				
QUADRANGLE		Driftwood 10	Dubois 1	Penfield 57	Hollton 1	Erie 56	Northeast 13				
LATITUDE		1.08 mi. S 41°25'	.06 mi. N 41°00'	2.40 mi. N 41°05'	2.61 mi. N 41°25'	2.54 mi. N 42°00'	.90 mi. N 42°00'				
LONGITUDE		.08 mi. E 78°15'	.35 mi. W 78°45'	.77 mi. E 78°40'	.56 mi. E 78°55'	1.66 mi. E. 80°10'	1.45 mi. W 79°50'				
DATE COMPLETED		1 - 9 - 58	5 - 2 - 58	2 - 7 - 58	1 - 24 - 58	7 - 2 - 58	5 - 4 - 58				
ELEVATION		1616	1563	1774	1572	1065	1491				
TULLY		6105 - 6202	6470 - 6570	6605 - 6725	5141 - 5172	1710 -	2384 - 2481				
ONONDAGA		6719 - 6751	7237 - Chert, 7265 - Show gas at 7269	7245 - 7261 Chert, 7261 -	5546 - 5602	1940 -	2629 - 2868				
ORISKANY		6751 - 6787 Show of gas	7318 - 7324	7319 - 7343 Gas	sandstone absent	2222 - 2245 Salt water	2868 - 2875				
HELDERBERG					5602 - 5680						
SALINA					5720 - 6859		Salt 2935 - 2984 3400 -				
LOCKPORT					6859 - 7078	2765 -	3440 - Black water at 3609				
ALBION	RED MEDINA (GRIMSBY)				7363 - 7387	3083 - 3257 6 Mcf gas at 3142					
	WHITE MEDINA (WHIRLPOOL)				7387 - 7528	3257 - 3277					
QUEENSTON					7528 -	3277 -					
TOTAL DEPTH		6789	7328	7345	7546	3282	3609				
DEEPEST FORMATION REACHED		Helderberg	Helderberg	Helderberg	Queenston	Queenston	Lockport				
RESULT		Former T.D. 6794 670 Mcf gas after frac R.P. 3400 psi 7 days	former T.D. 7273 2 gal SW per hr. Acidized Abandoned	Former T.D. 7319 2400 Mcf gas after deepening	Fraced 5624-34 No results Plugged back to 2400 for shallow gas	Former T.D. 3082 106 Mcf gas after frac R.P. 900 psi, 2 mo shut in Discovery Well	Former T.D. 3560 No results after deepening				

IY


Shallow Sand Oil Field
LAKE ERIE
Block I Pool
Bloss Pool
Meade Field
Roberts Pool
Forro Pool
NEW YORK
ABSENT
ORISKANY SANDSTONE
Bradford
Warren
Port Allegany
Ellisburg Pool
Titusville
Kane
PROBABLY ABSENT
Oil City
Franklin
Wells 54,56,58,66 in Benezette-Driftwood Field
Hicks Run Pool
Wells 30-32,37-40 in Boone Mt. Field
Wells 3-14,16-22 24-29,33-36,41-52 in Rockton Field
Reed-Deemer Field
Butler
Rupert Pool
INDIANA
Wells 76, 77,79, 80, 81 in Jacksonville Field
Wells 82-88, 90-96 in Nolo Field
OUTCROP OF ORISKANY
CLOSELY FOLDED
Pittsburgh
Wells 107-109 in Williams Pool
WESTMORELAND
Derry Pool
Wells 117, 118, 119 in St. Boniface Chapel Pool
Boswell Field
Seven Springs Field
Washington
Bedford
Waynesburg
FAYETTE
SOMERSET
BEDFORD
FULTON
FRANK
GREENE
WEST VIRGINIA
MARYLAND
OHIO
MERCER
CRAWFORD
WARREN
MCKEAN
POTTER
FOREST
ELK
CAMERON
CLINT
VENANGO
CLARION
JEFFERSON
CLEARFIELD
LAWRENCE
BUTLER
ARMSTRONG
BEAVER
ALLEGHENY
WASHINGTON
CAMBRIA
BLAIR
0 10 20

PLATE



OIL AND GAS MAP

PENNSYLVANIA

SHOWING DEEP WELLS
COMPLETED DURING

1958

- GAS
- GAS AND OIL
- SHOW OF GAS
- SHOW OF OIL
- SHOW OF GAS AND OIL
- DRY

PENNSYLVANIA GEOLOGICAL SURVEY
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TABLE I